



Durham E-Theses

Money and Power in the Viking Kingdom of York, c.895 – 954

GOOCH, MEGAN,LAURA

How to cite:

GOOCH, MEGAN,LAURA (2012) *Money and Power in the Viking Kingdom of York, c.895 – 954* ,
Durham theses, Durham University. Available at Durham E-Theses Online: <http://etheses.dur.ac.uk/3495/>

Use policy

The full-text may be used and/or reproduced, and given to third parties in any format or medium, without prior permission or charge, for personal research or study, educational, or not-for-profit purposes provided that:

- a full bibliographic reference is made to the original source
- a [link](#) is made to the metadata record in Durham E-Theses
- the full-text is not changed in any way

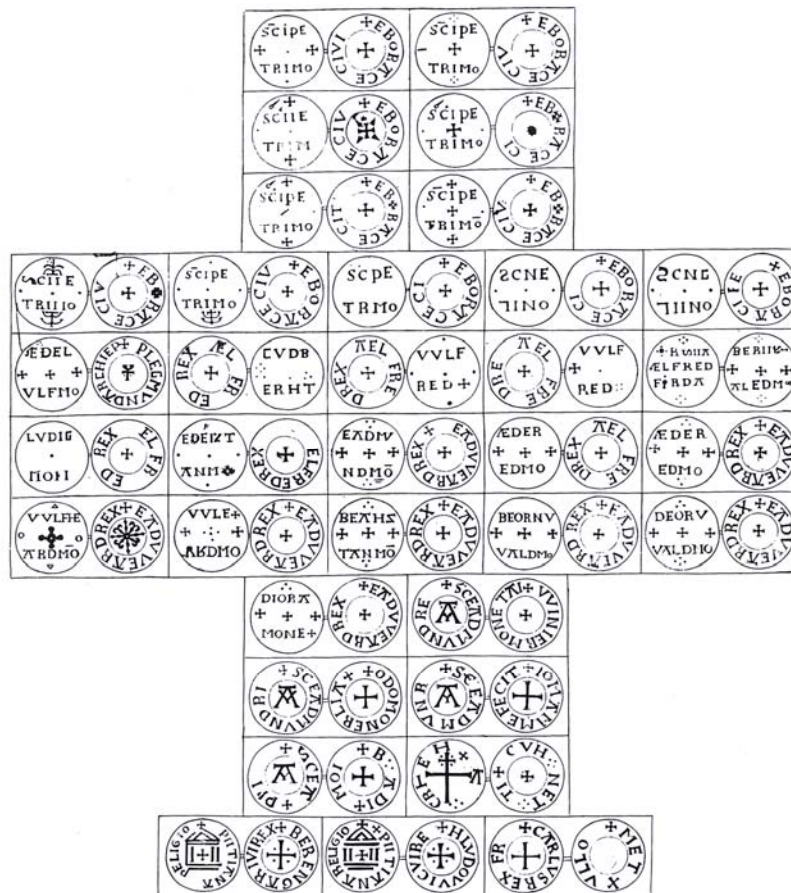
The full-text must not be sold in any format or medium without the formal permission of the copyright holders.

Please consult the [full Durham E-Theses policy](#) for further details.

Abstract

The aim of this thesis is to use numismatic evidence to help understand the political aims and achievements of the Viking kings of York, c.895-954. A variety of numismatic techniques will be used and tested for their suitability as a means of historical enquiry. Due to the limitations of the documentary sources for this period, coins will be used to provide an insight into the political workings of this kingdom. Firstly, the iconography and epigraphy of coins made in Viking York will be used to investigate how the Viking kings attempted to legitimise their rule. Secondly, it will be asked whether these coins were produced in sufficient quantity to form a usable currency and how the volumes of these currencies compare with other contemporary coinages, such as those issued by the Anglo-Saxons. Thirdly, to understand where the Vikings ruled and how effectively they could impose coin-use upon their kingdom, the economic influence of the Viking Kingdom of York will be examined by studying the distribution of the coins which were made both in York, and in other kingdoms. Finally, the ways in which coins and other forms of money, such as hacksilver, were used within and between Viking kingdoms will be examined to understand how effectively the Viking kings ruled their economy. It is hoped that this will reveal and refine existing knowledge about the ways in which the kings of York gained and maintained political power in York for much of the tenth century.

Money and Power in the Viking Kingdom of York, c.895 – 954



Megan Laura Gooch

This thesis is submitted for the degree of Doctor of Philosophy

Department of History, Durham University

September 2011

Contents

List of Figures	6
List of Tables	10
List of Abbreviations	11
Statement of Copyright	13
Acknowledgements	14
Dedication	15
1. Introduction. The Viking Kingdom of York: Historical and Numismatic Approaches	17
The Inadequacy of the Documentary Sources	18
Numismatics as an Historical Source	24
Money and Power in the Viking Kingdom of York	32
2. How did the Viking kings of York Legitimise and Rule their Kingdom?	34
Introduction: The Legitimation of Early Medieval Kingship	35
Religion and Religious Symbolism	35
Warfare	38
The Importance of Lineage	39
Legitimation through Association with <i>Romanitas</i>	42
The Legitimation of the Viking Kingdom of York: Discussion of the Numismatic Evidence	43
Numismatic Iconography as an Historical Methodology	43
Guthfrith (Guthred)	45
Siefred and Cnut	48
Æthelwold	59
The Swordless St Peter Coins	60
Rægnald	72
Sihtric and the Sword Coin Types	80

Æthelstan and the Later Anglo-Saxon Kings of York	90
Olaf Guthfrithson	95
Olaf Sihtricson, Rægnald II and Sihtric I	99
Eric Bloodaxe	105
Conclusion	109
3. What was the Volume of Currency in the Viking Kingdom of York?	112
The Theory of Die Estimation	113
Undertaking a Die Study	120
Analysing the Results of a Die Study	125
Calculating a Die Estimate	131
Comparing Anglo-Saxon and Viking Die Study Data	146
Conclusion	156
4. What was the Extent of Viking Kingdom of York?	158
The Documentary Evidence	159
Understanding the Evidence: Hoards and Single Finds	166
The Distribution of Viking-Age Coins	176
Conclusion	209
5. How was Money used in the Viking Kingdom of York?	211
Theories of the Viking-Age Economy	211
Identifying a Status Economy in York	218
The Bullion Economy	224
The Transition to a Coin-Based Economy	236
Conclusion	244
6. Conclusion: Understanding Coins as Historical Evidence for Viking York	246
Numismatics as an Historical Source	246
Money and Power in the Viking Kingdom of York	248

Further Questions and Research	252
Appendix I: Swordless St Peter Classification and Dies	256
Appendix II: Die Link Diagrams for Viking Coins of York	257
Appendix III: Die Data and Calculations for Viking, Anglo-Saxon and English Coin Types	262
Appendix IV: Gazetteer of Viking-age hoards	271
Appendix V: Types of crosses used on Anglo-Saxon and Viking coins	316
Bibliography	317

List of Figures

Frontispiece	Engraving by F. Tyler of the Harkirke hoard, taken from C.E. Blunt, B.H.I.H. Stewart and C.S.S. Lyon, <i>Coinage in Tenth Century England: From Edward the Elder to Edgar's Reform</i> (Oxford: Published for the British Academy by Oxford University Press, 1989), p. 250.	2
	British Library, Harleian MS 1437, 128v-129r	
1.1	A Sword St Peter type coin	26
2.1	Portrait coins of Diocletian and Æthelstan	42
2.2	The variety of crosses on coins of Siefred and Cnut	50
2.3	Byzantine influences on Viking coin designs	52
2.4	Crosses on the coins of Cnut and Siefred	53
2.5	Biblical inscriptions on the coins of Cnut and Siefred	54
2.6	The sign of the cross on the Cunnetti coins of Cnut	55
2.7	Carolingian-inspired lettering on the coins of Cnut and Siefred	56
2.8	Coin of Æthelwold	60
2.9	Keys on the Swordless St Peter coinage	64
2.10	Branch-shaped symbols of the Swordless St Peter coins	64
2.11	Star symbol on Swordless St Peter coins and other media	67
2.12	The Karolus monogram on Swordless St Peter and Rægnald coins	69
2.13	Hand symbols on tenth-century coins	73
2.14	Portraits on Roman, Anglo-Saxon and Viking coins	76
2.15	Rægnald's Bow and Arrow/Hammer type	77
2.16	The St Peter and Sihtric Sword types	82
2.17	The Sword St Martin type	87
2.18	The Anonymous and Rorivacastr Sword types	89
2.19	The main Anglo-Saxon coin type of the tenth century	91
2.20	Æthelstan's Totius Britanniae type	92

2.21	Tower and Flower types Anglo-Saxon reverse designs of the tenth century	94
2.22	Olaf Guthrithson's coins	97
2.23	Anglo-Saxon style coins of the Viking kings of the 940s	100
2.24	The Standard symbol on coins	103
2.25	Triquetras on coins	104
2.26	The coins of Eric	107
3.1	Schematic illustration of how a coin is made using a hammer	115
3.2	Medieval woodcut illustrating a mint worker striking coins using a hammer	116
3.3	Two seemingly-identical coins made from different dies	124
3.4	Schematic diagram of the die combinations in Olaf Sihtricson's coinage	126
3.5	How to read a die link diagram	128
3.6	The obverse and reverse of a Swordless St Peter coin	129
3.7	Schematic die diagram for the Swordless St Peter coinage	130
3.8	York halfgroat dies dated c.1353 – 1355	136
3.9	Graph showing the estimated dies per year used for Viking coin types minted at York	150
3.10	Graph showing the estimated dies per year used for Anglo-Saxon coins types from Edgar's Reform, c.973 to the Norman Conquest	153
4.1	The location of Anglo-Saxon forts or burhs	162
4.2	Map showing locations of meeting places and the dates of those meetings between Vikings and Anglo-Saxons in the tenth century	163
4.3	Map of Britain and Ireland showing the Five Boroughs, York and Watling Street	179
4.4	Map showing the distribution of Viking-age hoards in Britain	181
4.5	Map showing the distribution of all Viking-Age single-finds	182
4.6	Maps showing the contents of Viking Age hoards in Britain: Anglo-Saxon and Northern Danelaw	185
4.7	Map showing Viking Age hoards in Britain containing coins produced in the Southern Danelaw.	185

4.8	Maps showing the contents of Viking Age Hoards in Britain: Carolingian and Islamic	187
4.9	Maps of hoard locations in the Irish Sea area: Bangor and Chester	189
4.10	A Map of Chester, showing the locations of the three hoards	190
4.11	Maps of hoard locations in the Irish Sea area: Harkirke and Dean	191
4.12	Map showing the distribution of hogback stones in Britain	193
4.13	The Cuerdale hoard and York	195
4.14	Map showing location of Bossall/Flaxton, York and Vale of York hoards	196
4.15	Maps showing single finds in Viking Age England: Anglo-Saxon and Northern Danelaw	199
4.16	Map showing single finds of coins produced in the Southern Danelaw in Viking Age England	200
4.17	Map showing single finds of the Northern Danelaw, differentiated according to coin type	202
4.18	Map showing distribution of styca finds from c.800 to c.867	203
4.19	Maps showing single finds in Viking Age England: Carolingian and Islamic	206
4.20	Map showing all Viking-Age single finds with finds differentiated using colour to show where they were minted	208
5.1	The linear model for Viking age economies	213
5.2	The simultaneous model for Viking-age economies	215
5.3	The last Northumbrian and the first Viking coins of York	221
5.4	Map showing finds of non-numismatic Viking-age ornaments and ingots from hoards and single finds	222
5.5	Coins which have been tested for metal purity	231
5.6	Map showing the distribution of single finds of coins which were made in the Viking Kingdom of York	234
5.7	Chart showing the weight distribution of a sample of Anglo-Saxon coins of Edmund	238
5.8	Chart showing the weight distribution of a sample of Viking Swordless St Peter coins	239

II.1	Die link diagram of the Swordless St Peter coin type	257
II.2	Die link diagrams of the coins of the Viking Kingdom of York, 939-954	259
IV.1	The location of Cuerdale and Cuerdale in context showing the site of the hoard	275
IV.2	The location of Walmgate in York	278
IV.3	The location of St John's in Chester	281
IV.4	The location of the Chester Eastgate hoard	304
IV.5	The location of the Chester Castle Esplanade hoard	307
V.1	Cross forms on Anglo-Saxon and Viking coins	316

List of Tables

2.1	Coin types of the 940s	101
3.1	Table showing die estimates for the Swordless St Peter coinage	145
3.2	Table showing dies per year estimates for the Viking coinages of York	147
3.3	Table showing dies per year estimates for other early medieval coinages	149
4.1	How hoards can be used to refine the chronology of undated coin types	172
5.1	Table showing the composition of Viking-age hoards containing hacksilver from the Northern Danelaw	229
I.1	Table showing the classificatory scheme of tenth-century Two Line type coins	256
I.2	Table showing symbols found on Swordless St Peter coins	256
III.1	Die data and results for Viking, Anglo-Saxon and English coin types, c.895-1180	262

Abbreviations

<i>ASC</i>	<i>Anglo-Saxon Chronicles</i>	
<i>A</i>		J.M. Bately, <i>The Anglo-Saxon Chronicle: A Collaborative Edition, Volume 3, MS A</i> (Cambridge: Brewer, 1986).
		The Winchester Manuscript <i>Cambridge, Corpus Christi College MS 173, ff. 1^v-32^r</i> .
<i>B</i>		S. Taylor, <i>The Anglo-Saxon Chronicle: A Collaborative Edition, Volume 4, MS B</i> (Cambridge: Brewer, 1983).
		The Abingdon Manuscripts <i>BL MSS Cotton Tiberius Aiii, f. 178+ Avi, ff. 1-34</i> .
<i>C</i>		K. O'Brien O'Keefe, <i>The Anglo-Saxon Chronicle: A Collaborative Edition, Volume 5, MS C</i> (Cambridge: Brewer, 2001).
		The Abingdon Manuscripts <i>BL MS Cotton Tiberius Bi, ff. 155^v-64</i> .
<i>D</i>		G.P. Cubbin, <i>The Anglo-Saxon Chronicle: A Collaborative Edition, Volume 6, MS D</i> (Cambridge: Brewer, 1996).
		The Worcester Manuscript <i>BL MS Cotton Tiberius Biv, ff. 3-86</i> .
<i>E</i>		S. Irvine, <i>The Anglo-Saxon Chronicle: A Collaborative Edition, Volume 7, MS E</i> (Cambridge, D.S. Brewer, 2004).
		The Peterborough Manuscript <i>Oxford, Bodleian Library, MS Laud 636</i> .
<i>AU</i>	<i>Annals of Ulster</i>	S. Mac Airt and G. Mac Nichol (eds and trans), <i>The Annals of Ulster (to AD 1131): Text and Translation</i> (Dublin: Dublin Institute for Advances Studies, 1983).
<i>British Museum</i>	<i>British Museum Collection</i>	Objects are referenced by their unique accession number, usually in the form of: DEPARTMENT Year, Month.Number.
		MME, MM&E and P&E are now the Department of Prehistory and Europe; C&M is the Department of Coins and Medals.

<i>Chronicle</i>	John of Worcester's <i>Chronicon ex chronicis</i>	R.R. Darlington and P. McGurk (eds), <i>The Chronicle of John of Worcester, II: The Annals from 450 to 1066</i> , trans. by J. Bray and P. McGurk (Oxford: Clarendon, 1995).
<i>DGR</i>	William of Malmesbury's <i>De Gestis Regum</i>	R.A.B. Mynors (ed.), <i>Gesta Regum Anglorum = The History of the English Kings / William of Malmesbury</i> , completed by R.M. Thomson and M. Winterbottom (Oxford: Clarendon, 1998).
<i>EMC</i>	Fitzwilliam Museum's <i>Corpus of Early Medieval Coin Finds</i>	http://www.fitzmuseum.cam.ac.uk/dept/coins/emc/emc_search.php accessed on 14 January 2011. Coins will be referenced using the <i>EMC</i> 's reference system which denotes the Sylloge volume or year of publication followed by an underscore and then the object number. Each image will also be marked as either obverse or reverse. For example: 1021_0517 rev.
<i>HR</i>	<i>Historia Regum</i>	T. Arnold (ed.), <i>Symeonis Monachi Opera omnia</i> , 2 (London: Longman, 1885), pp. 3-283.
	<i>HR I Historia Regum Northern Recension</i>	T. Arnold (ed.), <i>Symeonis Monachi Opera omnia</i> , 2 (London: Longman, 1885), pp. 74-94.
	<i>HR II Historia Regum Worcester interpolation</i>	T. Arnold (ed.), <i>Symeonis Monachi Opera omnia</i> , 2 (London: Longman, 1885), pp. 105-27.
<i>HSC</i>	<i>Historia de Sancto Cuthberto</i>	<i>Historia de Sancto Cuthberto: A History of Saint Cuthbert and a Record of His Patrimony</i> , ed. and trans. by T. Johnson South (Cambridge: Brewer, 2002).
<i>Obv.</i>	<i>Obverse</i>	
<i>PAS</i>	<i>Portable Antiquities Scheme database</i>	http://finds.org.uk/database accessed on 25 August 2011. Objects are referenced by their unique PAS find number.
<i>Rev.</i>	<i>Reverse</i>	
<i>SCBI</i>	<i>Sylloge of the Coins of the British Isles</i>	R. Naismith (general editor), published by Spink or Oxford University Press for the British Academy (1958–).

Statement of Copyright

The copyright of this thesis rests with the author. No quotation from it should be published without the prior written consent and information derived from it should be acknowledged.

Acknowledgements

This work would not have been possible without the supervision of David Rollason and Mark Blackburn. David has, over the years, chivvied me along and taught me a great deal about how to write and to argue. Mark first piqued my interest in coins over a decade ago when I was an undergraduate, and his wonderful enthusiasm and knowledge of the subject have led me to where I am now. I hope I will continue to do justice to his memory in my numismatic work.

Thanks are due to my family who have supported me and encouraged me despite all we have been through. I'd like to thank Raoul especially for his practical help and emotional support throughout. To my colleagues who have supported me throughout the journey, at Spink, at the British Museum and at Historic Royal Palaces: your help, support and advice, computing facilities and kind offers of tea have made this possible.

Some individuals have very kindly offered their time and resources to assist me with this work. I have seen coins from private collectors Lord Stewartby, William Mackay and Alan Williams among others. Robert Bracey and Stewart Lyon have helped me remember all the maths and statistics I once knew and more. Yvonne and Paul Harvey have given sterling encouragement and scones when I lived in Durham. Richard Kelleher has given me insight into the world of GIS maps, and Dick Hodges, Andy Williams and Arthur Bryant have lent me their remarkable skills in digital photography.

Thanks to those at the Fitzwilliam Museum, who have helped and encouraged me over the years with ideas, references, suggestions and sales catalogues, and to Anna Gannon, who provided inspiration on iconography. Thanks again to the British Museum, to Mary for helping me find hidden books, and to Gareth Williams who gave time and shared his considerable knowledge of new finds with me. Finally thanks to Heather Cushing, who brought her friendship and her much-needed editorial skills.

Needless to say that to any others whose names I have omitted I owe both a thanks and an apology, and although I owe great thanks and gratitude to others, all mistakes remain my own.

Megan Gooch

HM Tower of London, September 2011

Dedication

For Rob, who would no doubt have appreciated the effort that went into this thesis, if not the contents.

Chapter 1: Introduction

The Viking Kingdom of York: Numismatic and Historical Approaches

Despite the best efforts of the eminent scholars working on this body of textual material, the exact chronology of the Viking Kingdom of York is still under discussion, and our understanding of the mechanisms through which the Viking kings ruled their kingdom is limited. The historical evidence mainly consists of annals and histories, with no law-codes, charters, formularies or other documents of government surviving for the Viking rule in York, and few of such surviving documents for the reigns of Anglo-Saxon kings in the city. The annalistic evidence is focused upon the times when the Vikings lost their kingdom, but takes us no further into understanding exactly how the Vikings ruled this kingdom for so long. The direct references to Viking kings in the texts are instructive, and give some insights into the diplomatic and military means by which the Viking kings attempted to legitimise and maintain their independent kingdom, but do not provide answers to the wider questions of how these invader kings successfully ruled an independent kingdom for nearly a century. There is one source of evidence which, for the Viking period at York, is plentiful, and has not been studied comprehensively to answer the question of how the Vikings ruled York: numismatic evidence. The coins have been examined to understand the skill of the people who made them, to refine the chronology of the kings of York, and to argue various theories concerning the location of mints under

Viking rule, but they have not been used to investigate and understand the mechanisms of power through which the Viking kings ruled their kingdom.

The Limitations of the Historical Sources

The historical sources, such as annals, charters, laws, histories and hagiographies, have been studied, reviewed and discussed by eminent scholars in the field, and here a very brief review of those sources will be undertaken. More comprehensive reviews have been compiled and will be referred to, but some repetition of the evidence here will be unavoidable.¹ The Viking period in York is here defined as 866 to 954.² That is, from the date at which Vikings invaded York to the date at which the last Viking king, Eric, fled York, which is generally taken to be in 954, the date given in the *Anglo-Saxon Chronicle*. There has, however, been some discussion as to the end date of the Vikings in York, as the *Historia Regum*, in both its sets of annals for this period, gives the date of Eric's exile as earlier in 950 and 952.³ There has recently been lively discussion as to the regnal dates of Eric, whose reigns are conventionally dated from 947 to 948 and from 952 to 954. Sawyer argues that Eric only ruled once at York on the basis that the D and E versions of the *Anglo-Saxon Chronicle* do not describe Eric's two reigns, but that both describe the same reign with slightly different dating and that the later saga sources suggesting two

¹ D. Rollason *et al*, *Sources for York History to AD 1000*, The Archaeology of York, I (York: York Archaeological Trust, 1998), pp. 18-164; F. Edmonds, 'History and Names', in *The Huxley Viking Hoard: Scandinavian Settlement in the North West*, ed. by J. Graham-Campbell and R. Philpott (Liverpool: National Museums Liverpool, 2009), pp. 2-12.

² *ASC*, A, s.a. 867 [866]; *ASC*, E, D, s.a. 954; *HR I*, s.a. 950; *HR II*, s.a. 952.

³ *HR I*, s.a. 950; *HR II*, s.a. 952.

reigns are unreliable.⁴ Instead, Sawyer trusts the *Historia Regum* chronology and dates Eric's sole reign from 950 to 952. Woolf has argued that Eric did in fact rule twice, but that his first reign was much earlier, towards the end of Æthelstan's reign in the later 930s.⁵ Here the conventional dating of Eric and Olaf each ruling for two reigns will be used, as this is still the most widely accepted dating for this period by both historians and numismatists alike.⁶

The historical evidence for the Viking period in England is scant compared to similar periods in Anglo-Saxon and Carolingian history, but more than enough to provide fertile ground for academic discussion and to give firm historical foundations to build upon, and indeed, dating coins would be impossible without the framework provided by the historical sources about the dates and reigns of kings. The main source, as ever, for the tenth century in England is the *Anglo-Saxon Chronicle*, which is not one text, but several, and each subject to the inherent bias created in texts that were largely written in the south of England.⁷ Whilst the versions are based upon common stock, the *Anglo-Saxon Chronicle* material for the tenth century is especially useful since the versions vary in the annals they include or omit, and how events are described, according to the place where the version was compiled.⁸ The different versions of the *Anglo-Saxon Chronicle*, especially the D, E and F versions, which were thought to have been written further north,

⁴ P. Sawyer, 'The Last Scandinavian Kings of York', *Northern History*, 31 (1995), 41.

⁵ A. Woolf, 'Erik Bloodaxe Revisited', *Northern History*, 34 (1998), 190.

⁶ These dates are: Olaf Sihtricson: 941-3, Sihtric Sihtricson: 944/5, Rægnald Guthfrithson: 943-4/5, Edmund: 944/5-6, Eadred: 946-8, Eric: 948, Olaf Sihtricson: 949-52, Eric: 952-4; as described in D.W. Rollason, *Sources for York History*, p. 689, and M.A.S. Blackburn, 'Presidential Address 2005. Currency under the Vikings, Part 2. The Two Scandinavian Kingdoms of the Danelaw, c. 895-954', *British Numismatic Journal*, 76 (2006), 217.

⁷ S. Keynes, 'Vikings', in *The Blackwell Encyclopaedia of Anglo-Saxon England*, ed. by M. Lapidge, J. Blair, S. Keynes and D. Scragg (Oxford: Blackwell, 1999), pp. 460-1.

⁸ Rollason, *Sources for York History*, p. 18.

probably in York in the early eleventh century, do provide extra clues as to the Vikings' activities in the North.⁹ The D, E, and F versions are largely based upon the same archetype, a lost set of northern annals, thought to have also been available to Symeon when compiling the *Historia Regum*. The brevity of the *Anglo-Saxon Chronicle*, as well as the aforementioned anti-Viking bias makes this source somewhat problematic and in need of supplement from other sources, but it is still the most coherent contemporary source, or set of sources, for this period. Æthelweard's *Chronicon Æthelweardi* is a Latin translation of an unknown version of the *Anglo-Saxon Chronicle*, which contains some additional details from other sources, and is a late tenth-century source, and as such is especially useful in one or two places for this additional information and clarity on Viking affairs.¹⁰

A group of sources thought to embody contemporary texts in the north provide valuable additional information. This group includes the *Historia Regum* attributed to Symeon of Durham,¹¹ Symeon's *Libellus de exordio atque procursu istius hoc est Dunelmensis ecclesie*,¹² and the *Historia de Sancto Cuthberto*.¹³ All three are thought to have been

⁹ M. Swanton (ed. and trans.), *The Anglo-Saxon Chronicles* (London: Phoenix, 2000), pp. xxi – xxviii; Rollason, *Sources for York History*, pp. 18-20; G.P. Cubbin, *The Anglo-Saxon Chronicle: A Collaborative Edition, Volume 6, MS D* (Cambridge: Brewer, 1996), pp. lxxviii, lx-lxi; P.S. Barker, *The Anglo-Saxon Chronicle: A Collaborative Edition, Volume 8, MS F* (Cambridge: Brewer, 2000), p. lxxix; S. Irvine, *The Anglo-Saxon Chronicle: A Collaborative Edition, Volume 7, MS E* (Cambridge: D.S. Brewer, 2004), p. lxiv.

¹⁰ A. Campbell, *The Chronicle of Æthelweard*, (London: Nelson, 1962); Rollason, *Sources for York History*, pp. 18-20.

¹¹ P.H. Blair, 'Some Observations on the "Historia Regum" attributed to Symeon of Durham', in *Celt and Saxon: Studies in the Early British Border*, ed. by N.K. Chadwick (Cambridge: Cambridge University Press, 1963), pp. 63–118; T. Arnold (ed.), *Symeonis Monachi Opera omnia*, 2 (London: Publisher, 1885), pp.3-283; J. Stevenson (ed.), *A History of the Kings of England*, (Church Historians of England, 1858; repr. Felinfach: Llanerch, 1987).

¹² D.W. Rollason (ed.), *Libellus de exordio atque procursu istius, hoc est Dunelmensis Ecclesie: Tract on the Origins and Progress of this the Church of Durham*, (Oxford: Clarendon Press, 2000).

¹³ T. Johnson South (ed.), *Historia de Sancto Cuthberto: A History of Saint Cuthbert and a Record of His Patrimony*, (Cambridge: Brewer, 2002).

written in the eleventh and twelfth centuries with access to a set of northern annals that no longer exist to us. The *Historia Regum* contains two parallel sets of annals covering the same years, which have been identified as containing a set based upon extracts from the same source used by William of Malmesbury, and another that is thought to have been based upon these lost northern annals.¹⁴ The eleventh-century manuscript of the *Historia de Sancto Cuthberto* is argued to embody genuine documents written in the tenth century with some later interpolations.¹⁵ The *HR* is known from a twelfth-century manuscript but the text is thought to incorporate a series of annals composed in the tenth century and found only in this compilation. These annals are known throughout this thesis as *HR I*, to differentiate them from the annals for the same years, called here *HR II*, according to Blair's analysis of the *HR*, in which he ascribed these latter annals to the same source as William of Malmesbury's *De Gestis regum*.¹⁶ The *Libellus de exordio* was seemingly written with access to both the *Historia de Sancto Cuthberto* and another version of the northern annals as well as those contained in the *Historia Regum*, and which is now lost, as it contained differences from the preserved versions.¹⁷ However, some of the events recorded are unknown to us from the earlier sources, presumably gathered from sources extant in the twelfth and thirteenth centuries that are now lost, and are often indistinguishable from some of the elaborations and fabrications made by the later authors to justify or make sense of their source material. There is evidence that William of Malmesbury had independent information when writing his *De Gestis regum*, as he expanded significantly upon Æthelstan's early life and succession, which only form very

¹⁴ Blair, 'Observations on the "Historia Regum"', pp. 105-6.

¹⁵ *HSC*, p. 36; Rollason, *Sources for York History*, p. 22.

¹⁶ Blair, 'Observations on the "Historia Regum"', pp. 105-6.; Rollason, *Sources for York History*, p. 27.

¹⁷ Rollason, *Sources for York History*, pp. 25-6.

short entries in the *Anglo-Saxon Chronicle*.¹⁸ John of Worcester's *Chronicle* appears to have had access to a lost version of the *Anglo-Saxon Chronicle* for tenth-century references and contains some valuable information for the tenth century.¹⁹ Roger of Wendover's *Chronica siue Flores historiarum* possibly had access to an unknown set of northern annals for the ninth century, which may have been known to Symeon.²⁰ These include further information on the succession of Northumbrian kings. For example, he clearly notes there are two separate kings named Egbert, and also discusses the reign of Ricsige more fully than other sources.²¹

Another group of sources comprises texts written or compiled outside England, including the *Annals of Ulster*, *Annals of Clonmacnoise* and the *Fragmentary Annals of Ireland*,²² and the *Life of St Catroe*.²³ These were written in the tenth century, and are preserved in later manuscripts. Extensive use of these sources, especially the Irish annals, has recently been used to great effect by Downham, who has constructed a theory of Hiberno-Scandinavian dynastic succession from the ninth to eleventh centuries from a wide range of Irish and English sources.²⁴ These sources are no doubt valuable, but great care must be taken in their interpretation, as the dislocation of dates and names from English sources can be potentially misleading; Smyth's work on the Scandinavian kings was widely

¹⁸ *DGR*, § 139.

¹⁹ *Chronicle*; Rollason, *Sources for York History*, p. 29.

²⁰ J. Stevenson (ed.), *The Church Historians of England, II, Part I: The Anglo-Saxon Chronicle, The Chronicle of Florence of Worcester* (London: Seeleys, 1853).

²¹ Rollason, *Sources for York History*, p. 32, p. 63; *FH*, pp. 474-8.

²² S. Mac Airt and G. Mac Nichol (eds and trans), *The Annals of Ulster (to AD 1131): Text and Translation* (Dublin: Publisher, 1983); D. Murphy (ed.), *The Annals of Clonmacnoise: Being Annals of Ireland from the Earliest Period to A.D. 1408*, trans by C. Mageoghagan (Dublin: Royal Society of Antiquaries of Ireland, 1896); J. N. Radner, *Fragmentary Annals of Ireland* (Dublin: Dublin Institute for Advanced Studies, 1978).

²³ J. Bollandus, (ed.), *Acta Sanctorum, Martii, I* (Antwerp, Brussels, Tongerlo and Paris, 1668), pp. 469-81.

²⁴ C. Downham, *Viking Kings of Britain and Ireland: The Dynasty of Ívarr to AD 1044* (Edinburgh: Dunedin, 2007).

criticised due to his uncritical use of the Irish sources.²⁵ The *Life of St Catroe* was written by someone with apparent access to the saint's disciples, and recalls his earlier pilgrimages throughout the north of England. The information has been used by Woolf to establish the dating of Eric's reigns, despite the extreme difficulty in matching this source with the existing historical chronological framework.²⁶

Finally, there are some later Scandinavian sagas that shed some light on this period of York history, although, with the disadvantages of being both chronologically and geographically dislocated from the events they describe, their reliability is much more difficult to ascertain. Sources such as the *Saga of Egil Skallagrimsson* and Snorri Sturlusons' *Heimskringla* cycle are thought to contain interpolated and largely unaltered earlier sources, usually in the form of skaldic verses, which some argue are preserved tenth-century originals.²⁷ Smyth has used this material to create a coherent narrative for the Viking period in Dublin and York, in the belief that although greatly embellished and distorted, the historical framework is essentially sound.²⁸ Yet the assumption that these sources are in any way a true reflection of tenth-century chronology has come under serious scrutiny, and the reliability of these sources has been called so far into doubt that

²⁵ For example, R.W. MacTurk, 'Review: Alfred P. Smyth, *Scandinavian York and Dublin*', *Saga-Book of the Viking Society*, 19 (1974-77), 471-4.

²⁶ A. Woolf, 'Erik Bloodaxe Revisited', 190; Rollason, *Sources for York History*, pp. 21-2.

²⁷ M. Townend, 'Whatever Happened to York Viking Poetry? Memory, Tradition and the Transmission of Skaldic Verse', *Saga-Book: Viking Society for Northern Research*, 27 (2003), 82; S. Nordal (ed.), *Egils Saga Skalla-Grímssonar* (Reykjavík: Hid Íslenzka, 1933); B. Aðalbjarnarson (ed.), *Snorri Sturluson: Heimskringla*, 3 (Reykjavík: Hid Íslenzka Fornritafélag, 1941).

²⁸ A.P. Smyth, *Scandinavian York and Dublin: The History and Archaeology of Two Related Viking Kingdoms*, I (Dublin: Humanities Press, 1975-9), p. 11. See also A.P. Smyth, *Scandinavian York and Dublin: The History and Archaeology of Two Related Viking Kingdoms*, II (Dublin: Humanities Press, 1987); A.P. Smyth, *Scandinavian Kings in the British Isles 850-880* (Oxon: Oxford University Press, 1977).

they are best left to argue minor points of tenth-century history rather than to rewrite the main historical narrative.²⁹

Numismatics as an Historical Source

There are some advantages in the use of numismatic evidence over documentary sources. Ideally both textual and numismatic evidence should be used together, and this approach has proved very successful.³⁰ Yet the Viking period in York has a lack of coherent contemporary documentary evidence which means that coins become a primary and fundamental source of evidence, which should be used as far as possible independently of the incomplete documentary narratives. The kinds of information that can be gleaned from numismatic evidence are different from that which can be gleaned from textual sources, in that they can provide a wider scope for understanding the sophistication of the mechanisms of power, and especially economic questions. Coins, unlike most other archaeological artefacts can often be dated very closely, to a single year in some cases (although only in conjunction with historical sources), which makes them exceedingly useful in examining details such as the chronology of a kingdom.

Looking at objects other than documents to understand the past can pose problems for the historian. Yet all historical documents, whether annals, poems, charters or religious texts come to us in physical form, which is all too easy to forget in the quest for understanding

²⁹ Sawyer, 'Last Scandinavian Kings of York', 42n.

³⁰ Essentially numismatic works, such as R. Naismith, 'Coinage and History in Southumbrian England, c.750-865' (unpublished doctoral thesis, University of Cambridge, 2009) and R. Naismith, *The Coinage of Southern England 796-c. 865*, (London: British Numismatic Society Special Publication, forthcoming), have asked and answered questions within an historical framework; D.W. Rollason, *Northumbria, 500-1100: Creation and Destruction of a Kingdom* (Cambridge: Cambridge University Press, 2003) uses numismatic and archaeological material alongside traditional historical sources to great effect.

what those documents mean. The disciplines of Palaeography and Codicology are auxiliary sciences that emphasise the materiality of our sources, but these are generally concerned with the physical aspects of book-making, such as ink use, interlineal glosses, and book bindings, which nonetheless reminds the historian of the archaeological nature of his sources.³¹ In many respects coins are similar. Unlike so many other archaeological finds they usually contain writing, which helps immeasurably in understanding, placing and cataloguing these objects.

Coins are a useful bridge between the disciplines of archaeology and history in that they are objects with writing. But like any document, it is not merely the words that can provide information about the period in which it was made. In common with documentary evidence, a great deal can be understood by studying the letter forms and the tools used to make them, and also looking at the accompanying images. Looking at tools and lettering can, as with manuscripts, provide clues as to who wrote the words. To make medieval coins, letters and images were engraved onto the softened steel of dies using a limited toolkit of punches. The varying angles and pressure of the punches and hammer blows is what creates, from such a small range of tools, such variety of designs.

³¹ B. Bischoff, *Latin Palaeography: Antiquity and the Middle Ages*, trans. by Daíbi Ó Croinin and David Ganz (Cambridge: Cambridge University Press, 1990), pp. 1-3.



Figure 1.1 A Sword St Peter type coin IIIIC [reversed C]II instead of the literate S[an]C[t]I PETRI MO[neta].³² This coin is usually described as ‘retrograde’ because of the poor literacy of the engraver, who has not understood the meanings of all the components of the letters and reduced nearly each letter to a single minim. However, to the illiterate eye, this coin still looked enough like a literate Sword St Peter type to be exchanged as an official coin.

The styles and forms of letters chosen can tell much about the level of literacy of the engraver as well as the influences on him of normal writing forms. Coins such as that shown in Figure 1.1 above, are thought to be the work of illiterate die engravers, where the letters have become merely a line of minims with the connecting bars and ligatures having been lost in translation. It is easy to criticise the skill (or lack thereof) of the engraver and call his work retrograde when mistakes in spelling or engraving are spotted, yet it must be remembered that the art of engraving a die is the art of working in mirror image. Dies are engraved into the metal to impress a relief pattern upon the coin. Another factor perhaps in the common ‘retrograde’ features of a coin is the mass-produced nature of coins. In the work of seal-maker also working in mirror image, errors in spelling or design would not be tolerated for an object directly representing an individual or institution of high standing with legal importance.³³ Yet a coin, although representative of a monarch or institution, was produced on such a scale that minor variations were tolerable so long as the whole remained recognisably coin-like.

³² EMC, 1002_0517 rev.

³³ I.H. Garipzanov, ‘The Image of Authority in Carolingian Coinage: The Image of a Ruler and Roman Imperial tradition’, *Early Medieval Europe*, 8 (2) (1999), 214.

For millennia humans had functioned without the use of coins, and the Vikings themselves were strangers to coins as a medium of exchange when they arrived in York. Why the Vikings chose to adopt coinage will be addressed below, but first, the question of why anyone adopted coins at all needs to be addressed.

From a practical viewpoint, the materials from which coins are made, precious metals such as silver and gold, are valuable in two ways. Firstly, these metals are relatively stable, do not corrode easily and can withstand being in circulation and exchanged between people; they can even withstand being buried for millennia and remain whole and recognisable when dug up in most soil conditions. Secondly, and perhaps most obviously, they are made of metals that have been ascribed inherent value, which means the coin can be melted down and turned into other coins or simply exchanged as bullion if it is needed.

In the ancient Greek world, the Lydians were the first to make coins when they struck weighed pieces of electrum, which is a naturally occurring alloy of silver and gold.³⁴ Yet a coin is not merely a lump of durable precious metal, but an artefact created by people and given social meaning by them. A coin is more than the sum of its parts: it is worth more as a coin than it is as a piece of metal. The value that is added to its intrinsic worth comes from how it is transformed from mere metal into coin and by whom. The process

³⁴ C. Eagleton and J. Williams (eds), *Money: A History*, rev. edn (London: British Museum Press, 2007), p. 23-4.

of minting a coin is not in itself a difficult or complex one, and it is one that can be accomplished by someone with very little specialist training and only a basic knowledge of metalworking. It is therefore not artistry or craftsmanship that adds value to the coin. The single most important factor in creating a coin is the authority that makes and guarantees that coin. Since ancient times, debate has raged over the function of stamping a design onto a coin, the idea that the stamp was a mere mark of value begs the question why nobody thought of this beforehand if trading in bullion was so inconvenient.³⁵ The solution is that the stamp was more than a mark of value; it gave value in itself to the coin.³⁶

This stamp of authority functioned in two ways: firstly, coins could be instantly recognised across a wide area or empire, and this recognition inspired trust and exchange of the coins as money. For example, the distinctive design on the coinage of the politically and economically successful city state of Athens was widely copied throughout the Greek world, from areas in modern-day Turkey to Egypt, because the images of Athena and her owl were trusted symbols in the ancient world.³⁷ Secondly, it meant that the quality of coins could be accounted for on a large scale as well as individual moneyers being held accountable for any faults in fineness or weights of their coins. For example, in the 1540s, under Henry VIII, a state-sponsored debasement of coinage was instituted in England to line the Crown's dwindling coffers with extra precious metal.³⁸ Although the

³⁵ Eagleton and Williams, *Money: A History*, p. 27.

³⁶ A. Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations*, ed. by E. Cannon (Chicago: University of Chicago, 1996 (1776)), p. 29.

³⁷ Eagleton and Williams, *Money: A History*, p. 27.

³⁸ J. Craig, *The Mint: A History of the London Mint from A.D. 287 to 1948* (Cambridge: Cambridge University Press, 1953), p. 106.

new debased coins still bore the official portrait and inscription of Henry VIII, the coins were widely mistrusted by the public, and were nicknamed ‘Old Copper Nose’ because of their high copper content which meant that when they wore through use, the high point of the coins, Henry’s nose, wore to a distinct reddish hue.³⁹ Similar meddling with coinage for the purposes of the state can be seen in the great weight variations in the pennies of Æthelred II, which, it is argued, were not the result of poor workmanship but a deliberate policy instituted by the government to relieve the burden placed on the exchequer by the heavy Danegeld payments.⁴⁰ The stamp on coins could also serve to check the integrity of individual moneyers where they, or their city, were named on coins. Various items of legislation from the tenth century onwards reinforce the need for the honesty of moneyers. Æthelstan’s Grateley law-code stipulates the need for moneyers to work in towns, and sets out severe punishments for striking false or light-weight coins.⁴¹ Later law codes of Æthelred and Cnut confirm and expand upon these laws, with the penalty for striking false money being increased from amputation of the hand to ordeal by innocence and death, and the added stipulation that no one should refuse pure money on pain of punishment.⁴²

Unlike many archaeological artefacts, the coin is something that was created in an official capacity and which was guaranteed and regulated by the stamp of authority in the design. As such it can (and will) be argued to represent the wishes of the king or his closest

³⁹ Spink, *Coins of England and the United Kingdom*, 45th edn (London: Spink & Son, 2009), p. 219.

⁴⁰ B.H.I.H. Stewart, ‘The English and Norman Mints’ in *A New History of the Royal Mint* ed. by C.E. Challis (Cambridge: Cambridge University Press, 1992), pp. 58-9.

⁴¹ II Athelstan 14 in D. Whitelock, *English Historical Documents*, c.500-1042, I (London: Eyre and Spottiswoode, 1955), p. 380.

⁴² R.S. Kinsey, ‘Anglo-Saxon Law and Practice relating to Mints and Moneyers’, *British Numismatic Journal*, 29 (1958-9), 12-16.

advisors.⁴³ A coin is an official product of a monarch's reign, unlike the many pots, iron fragments and precious-metal brooches that turn up in archaeological excavations of this period. Coins are also unlike documents in that they were not merely produced for the administrative benefit of a kingdom or individuals, such as charters, nor for the intellectual benefit of monastic scholars, such as annals, histories and hagiographies. This allows the historian a completely different perspective on the period.

A more tangible difference to other forms of archaeological objects is that coins are far more capable of providing a precise date range than other artefacts of this period. This is because coins usually contain the name of the monarch under which they were made, and can also contain other information, such as the place they were made, the name of the man in charge of making them and even a date. Coins of the Anglo-Saxon period commonly bear the name of the monarch on the obverse, and the name of the moneyer and the place they were made on the reverse. This is different from Carolingian coins of the same period, where the name of the moneyer was not a usual feature.⁴⁴ The addition of moneyer's names has given the keen numismatic collector and coin dealer endless hours of amusement in finding new combinations of moneyer, mint and monarch, but the value of this information is great for the study of the period. In the case of the Viking period at York, moneyers' names can be used to see where the same moneyer produced coins under subsequent rulers when there were changes in the king of York. It is clear from his coins that in the 930s that the moneyer Æthelferth worked for both the Viking king Olaf Guthfrithson, as well as the Anglo-Saxon King Æthelstan in York.

⁴³ H.B.A. Peterson, *Anglo-Saxon Currency: King Edgar's Reform to the Norman Conquest* (Lund: Gleerup, 1969), p. 10.

⁴⁴ P. Grierson, *The Coins of Medieval Europe* (London: Seaby, 1991), pp. 40-8.

There are, however, limitations with dating coins. In cases where coins are widely imitated in the name of a long-dead ruler, such as the Hiberno-Norse coinage in eleventh-century Ireland, the date becomes irrelevant, as the coin is a mere left-over, the name copied again and again without meaning.⁴⁵ But coin types such as these, which have become immobilised, are not thought to have been produced in Viking York, and pose no such problems with dating. Instead the main problems in establishing chronology for Viking coins in England were to do with the fact that there are at least three monarchs named on coins who appear nowhere in the historical sources and it was very difficult to know where to place them. However, work such as Dolley's seminal article on the coins of Viking York from 939 to 954 have refined this chronology and have made the task of examining the Viking kings of York and their coins immeasurably easier.⁴⁶

The thrust of this thesis, however, is that coins can be much more than a useful dating tool for the archaeologist or historian, but a source in their own right; by asking the right questions of the evidence, new answers can be found about the Vikings and how they reigned in their kingdom from York. The problem, as with collating any sources, is that the information sometimes does not all fit together. As the problems defining the chronology of the Vikings at York show, this problem is all too familiar for the medieval historian struggling to understand when an event occurred from three separate manuscripts with three different dates. The answer is sometimes that the coin evidence

⁴⁵ R.H.M. Dolley, *The Hiberno-Norse Coins in the British Museum*, Sylloge of Coins of the British Isles, 8 (London: Trustees of the British Museum, 1966).

⁴⁶ R.H.M. Dolley, 'The Post-Brunanburh Coinage of York: With some Remarks on the Viking Coinages which Preceded the Same', *Nordisk Numismatisk Årsskrift*, 1957-8 (1958), 13-85.

will not fit perfectly within the narrative structure and great care must be taken to avoid the trap of trying to force the evidence to fit.

Money and Power in the Viking Kingdom of York

In the chapters that follow, the numismatic evidence will be approached in several different ways. Firstly, the use of coins as an art historical source will be examined. In Chapter 2 coins will be used to understand how the Viking kings projected themselves to their coin-using public. By following recent work undertaken on imagery and iconography on coins of the earlier Anglo-Saxon period, as well as by using a variety of archaeological comparisons, the coins of the Vikings will be closely studied to see whether the political intentions and machinations, so often absent in the written sources, can be discerned.

By looking at the words and designs on coins, the historian can understand further the government or ruler who issued those coins. The power of the imagery on a coin cannot be overestimated, the image and inscription providing a powerful version of the king's own image as they are an official product of the state, sanctioned either by the king himself or at the highest level of government.⁴⁷ Coins came not just to represent the authority that issued them but become representative, and a reflection of that authority.⁴⁸

⁴⁷ M.A.S.Blackburn, 'Crosses and Conversion: The Iconography of the Coinage of Viking York ca. 900', in *Cross and Culture in Anglo-Saxon England: Studies in Honour of George Hardin Brown*, ed. by K.L. Jolly, C.E. Karkov and S.L. Keefer (Morgantown: West Virginia University Press, 2008), p. 172.

⁴⁸ J. Parry and M. Bloch, 'Introduction: Money and the Morality of Exchange', in *Money and the Morality of Exchange*, ed. by J. Parry and M. Bloch (Cambridge: Cambridge University Press, 1989), p. 1; Garipzanov, 'Image of Authority in Carolingian Coinage', p. 198.

Secondly, Chapter 3 will ask whether Viking coins were produced in sufficient quantity to form a usable currency and how the volumes of these currencies compare with other contemporary coinages, such as those issued by the Anglo-Saxons. A range of numismatic methodologies will be used to understand the volume of Viking coinages, the results will be critically analysed and compared with data from other coinages that have been analysed using the same techniques. This technical data will then be used to understand how large the Viking economy might have been in comparison to the West Saxon economy.

Thirdly, the economic influence of the Viking Kingdom of York will be examined by studying the distribution of the coins made in that kingdom. In understanding how coins came to be lost and buried, and what patterns of economic behaviour and settlement these represent, a picture of the level of cultural influence and economic control can be built. This will then be used to analyse the level of control the Viking kings exerted from York, and to show far this control spread over the north of England.

Finally, the ways in which coins were used will be examined. Using wider discussions about the role of coins and bullion as money in the Viking world, the location and contexts of hoards containing coins of Viking York will be examined. This data will then be used to question how the coins produced by the Viking kings functioned in their kingdom, and what effect their use had upon their rule.

Chapter 2

How Did the Viking Kings of York Legitimise and Rule Their Kingdom?

In order to understand the Viking rulers of York it is necessary to place them in a wider context and theoretical framework, and look at how contemporary and neighbouring kingdoms functioned. In many cases, such as with Anglo-Saxon England, Carolingian Francia and Ottonian East Francia, there is a much greater wealth of documentary evidence about the thoughts, processes and actions of the rulers of these kingdoms.¹ In this chapter it will be asked whether the Vikings' different background and late arrival into English politics meant that they had a different approach to kingship from that of the English, based as it was primarily upon military prowess. Were the Viking rulers Germanic kings who were basically tribal leaders or were they already sophisticated leaders when they arrived in England?² It will be asked whether these kings became deeply embedded in a Carolingian way of ruling, in which the support of the Church, the heritage from the Roman Empire, as much as successful warfare, were central tenets of governance, and whether this was different from existing modes of kingship in Scandinavia.

¹ R. McKitterick, *The Carolingians and the Written Word* (Cambridge: Cambridge University Press, 1989), p. 23.

² J.M. Wallace-Hadrill, *Early Germanic Kingship in England and on the Continent* (Oxford: Clarendon Press, 1971), p. 3.

This chapter will address the theory of early medieval kingship to set the context in which the Viking rulers found themselves when they came to rule at York. The subject of money and coins as an historical source will then be addressed to understand how the day-to-day handling of coins was affected by the wishes of Viking kings and the ideas emanating from their political sphere. The next section will then consider in depth the evidence of coins, especially the iconography and imagery represented upon them, as well as documents, to attempt to answer the question of how far Viking kings tried to emulate established patterns of kingship in respect of religion, warfare and lineage in order to establish and legitimise their rule in York.

Introduction: The Legitimisation of Early Medieval Kingship

Religion and Religious Symbolism

Religion was essential to early medieval kings throughout most of Europe, both as a belief and in the practical support of the Church in ruling. The religion was of course, Christianity, and adherence to it was mandatory, not just for the support of important ecclesiastical figures such as archbishops and bishops, but also for the populace. The former were crucial to the coronation ritual itself, performing the anointment of the new monarch, and confirming his divine right to rule. This ritual of king-making and its association with Christianity was pioneered under the Carolingians and became

increasingly widely used in the tenth century.³ The support of the Church during and after this ritual, and the use of ritual itself, gave a king new and confirmed authority.⁴ For the sons of Louis the Pious legitimacy and support from the Church became increasingly important after their father had altered rules of succession to favour only one son rather than all of them.⁵ The Church in return gained a key role in choosing and making the new king, as well as more direct benefits such as favours distributed to monastic houses.⁶

The Church had a spiritual role in supporting a king in his connection with God. For example, the disastrous reign of Eadwig was placed squarely on his own shoulders for ignoring the advice and counsel of Dunstan.⁷ In terms of the practical support of the king, monasteries were great powerhouses of wealth and production, as well as being full of well-educated and literate men with access to documents, and who could advise the king and form part of his council. Their skills in writing, documenting and creating and checking laws were a necessary function needed by the king.⁸ In addition, the religious houses could function as lay lords did in providing wealth from their lands, in protecting

³ J.L. Nelson, 'The Lord's Anointed and the People's Choice: Carolingian Royal Ritual,' in *Rituals of Royalty: Power and Ceremonial in Traditional Societies*, ed. by D. Cannadine (Cambridge: Cambridge University Press, 1987), pp. 159-66; W. Ullmann, *The Carolingian Renaissance and the Idea of Kingship* (London: Methuen, 1969), pp. 43-6; J.L. Nelson, 'Rulers and Government', in *The New Cambridge Medieval History, c.900-c.1024*, III, ed. by T. Reuter (Cambridge: Cambridge University Press, 1999), p. 115; Wallace-Hadrill, *Early Germanic Kingship*, pp. 113-4.

⁴ C. Geertz, 'Religion as a Cultural System', in *Reader in Comparative Religion: An Anthropological Approach*, ed. by W.A. Lessa and E.Z. Vogt, 2nd edn (New York: Harper and Row, 1965), p. 76.

⁵ J.L. Nelson, 'The Frankish Kingdoms, 814-98: The West', in *The New Cambridge Medieval History, c.700-c.900*, II, ed. by R. McKitterick (Cambridge: Cambridge University Press, 1995), p. 115.

⁶ Nelson, 'Rulers and Government', p. 107; Wallace-Hadrill, *Early Germanic Kingship*, p. 131.

⁷ ASC, A, s.a. 955-6; John of Worcester, *Chronicle*, s.a. 956.

⁸ K.B. Leyser, 'Ottonian Government', *English Historical Review*, 69 (1981), 727; McKitterick, *Carolingians and the Written Word*, p. 31.

land for the king, and in maintaining national security.⁹ King and Church lived together in a symbiotic relationship, with the king ruling and maintaining the Christian faith, and the Church sanctioning him ritually through coronation and anointing, and supporting him both financially and militarily while he, in return, received spiritual and physical protection within his earthly realm.

The role of the king as a Christian is a theme of early medieval kingship both in artistic and literary representations. A great king had to possess the attributes of a good Christian and be faithful, pious, humble and wise, as well as willing to act as godfather to new recruits to the faith. For example, Alfred sponsored Guthrum in baptism at Aller in 878.¹⁰ The baptism bound Guthrum to the Anglo-Saxon king in religious subjugation following his defeat by Alfred at the Battle of Edington. This ritual framed an act of political subjugation into a religious conversion from paganism to Christianity. The fight against the pagans actually enhanced the image of some kings, especially if the battles went their way, as a physical manifestation against the threat of evil and paganism.¹¹

The early medieval king has also been defined as sacral, in that both before and after the arrival of Christianity, the king was 'marked off from his fellow men by an aura of specialness which had its origins in more or less direct associations with the supernatural', such as in divine descent from pagan gods.¹² Under the influence of Christianity, the king

⁹ Ibid., 736; Nelson, 'Frankish Kingdoms: The West', p. 135.

¹⁰ ASC, A, E, s.a. 878.

¹¹ Wallace-Hadrill, *Early Germanic Kinship*, p. 141.

¹² R. W. MacTurk, 'Scandinavian Sacral Kingship Revisited', *Saga-Book: Viking Society of Northern Research*, 24:1 (1994), 31; R.W. MacTurk, 'Sacral Kingship in Ancient Scandinavia: A Review of some Recent Writings', *Saga-Book of the Viking Society*, 19 (1974-77), 139-69 discusses the different terminology of sacral, divine or cult-king in this review of material from the 1960s and

himself was sometimes portrayed not just with Christian attributes but as a specific figure from Biblical history, notably as Christ or King David. Christ was an obvious exemplar as the son of God, King of Kings and divine ruler who had lived on earth. David was a biblical warrior-king who was protected by the hand of God and is in turn perceived as Christ-like in his attributes and achievements.¹³ David provided a model for Charlemagne in his role as war-leader and an earthly king with divine sanction.¹⁴ Other kings also drew inspiration from Old Testament: Charles the Bald compared himself to Solomon and his divine wisdom, and Alfred saw his role as lawgiver as a descent from Moses.¹⁵

Warfare

The warrior aspect of kingship was also important, and most famously idealised in Charlemagne in Einhard's *Life* and in conscious parallels with King David.¹⁶ The king was a representative and figurehead for his people, and frequently described in heroic terms, sometimes even with supernatural powers. His heroism was in his role as the defender of the faith and of the kingdom, even expanding it. Æthelstan is especially fêted as the conqueror of all England by his contemporaries in texts and on coins, as well as by later chroniclers.¹⁷ Although kingly losses and defeats do occur, they feature much less

early 1970s; W. A. Chaney, *The Cult of Kingship in Anglo-Saxon England* (Manchester: Manchester University Press, 1970), p. 81; J.L. Nelson, 'Royal Saints and Early Medieval Kingship', in *Sanctity and Secularity: The Church and the World: Papers read at the Eleventh Summer Meeting and the Twelfth Winter Meeting of the Ecclesiastical History Society*, ed. by D. Baker, *Studies in Church History*, 10 (Oxford: Blackwell, 1973), pp. 39-44.

¹³ Wallace Hadrill, *Early Germanic Kingship*, p. 130.

¹⁴ J. McManners, *The Oxford Illustrated History of Christianity* (Oxford: Oxford University Press, 2001), p. 101.

¹⁵ *Ibid.*, p. 102.

¹⁶ Wallace-Hadrill, *Early Germanic Kingship*, p. 128.

¹⁷ For example in the poem 'The Battle of Brunanburh, *ASC*, s.a. 937; see discussion in M. Wood, 'The Making of King Athelstan's Empire: An English Charlemagne', in *Ideal and Reality in*

frequently or are merely alluded to when they happen. Unfortunately for the Vikings, their military prowess was not recorded as a positive attribute by their enemies,¹⁸ and their defeats are relished in the annals both by the Anglo-Saxons and the Irish.¹⁹ The few sources written by Vikings do celebrate their victories, but these form a small part of the Viking narrative for York.²⁰ The king in early medieval society, therefore, is not only the secular and spiritual father of his people, but also an able warrior and defender of his subjects.²¹

The Importance of Lineage

By the tenth century it was not enough for just any military hero to set himself up as king, as a suitable lineage was required; whether this lineage was solidly genealogical or tenuously mythical was irrelevant, as long as the new king was perceived to come from suitable stock. However, the importance of the hereditary right to rule was not yet as great as it would become in the later middle ages. Amongst Anglo-Saxon kings certainly, the principle of male primogeniture was not yet established, and when one king died, the nearest male relatives were all eligible for the title. In tenth-century England ‘fraternal succession jostled with filial succession’,²² as the sons of Edward the Elder: Æthelstan, Edmund and Eadred all reigned in succession before the next generation had a chance of the throne. Did the Vikings in York follow the Carolingian or Anglo-Saxon laws of

Frankish and Anglo-Saxon Society, ed. by P. Wormald, D.A. Bullough and R. Collins (Oxford: Oxford University Press, 1983), pp. 250-72; S. Foot, *Æthelstan: The First King of England* (New Haven: Yale University Press, 2011), p. 154-5.

¹⁸ For example: *AU*, s.a. 917.

¹⁹ For example: *AU*, s.a. 902; the poem the ‘Battle of the Five Boroughs’, *ASC*, s.a. 942.

²⁰ E.O.G. Turville-Petrie, *Origins of Icelandic Literature* (Oxford: Clarendon, 1953), pp. 41, 223; Rollason, *Sources for York History*, pp. 33-4.

²¹ Wallace-Hadrill, *Early Germanic Kingship*, pp. 128-9.

²² Nelson, ‘Rulers and Government’, p. 104.

succession, or did they use their own rules of heredity that they had imported from Scandinavia?

It has been suggested that the Viking inheritance of kingdoms was fairly fluid or divided between the kingdoms of York and Dublin, with the latter acting as a stepping-stone to the greater prize of the throne at York.²³ This interpretation, however, depends on accepting the links between various Viking leaders as dynastic or familial under the aegis of the ‘Grandsons of Ivar’.²⁴ While they undoubtedly are Vikings referred to in the Irish sources under this name, there is some doubt as to how far one can link various similarly-named individuals in sources from either side of the Irish Sea. A favoured argument for the existence of a dynasty descended from Ivar is the recurrence of various names such as Ivar, Guthfrith, Rægnald and Olaf amongst the kings of York and Dublin, but the evidence linking these names to both the thrones of York and Dublin is at best equivocal.²⁵

The Vikings themselves had no Anglo-Saxon or early royal lineage to trace their descent from, but they had a wealth of history and mythology of their own from which they could claim ancestry. Some scholars argue that the dynasty of Ivar was one such attempt at legitimisation in using the mythical descent of Ragnar Lothbrok and then his earthly descendant Ivar as a suitable claim to hereditary right to rule.²⁶ Ivar himself, a leading member of the Great Army, acquitted himself bravely, but his legend seems to have

²³ For example Smyth, *Scandinavian York and Dublin, II*, p. 31 describes Guthfrith leaving his son Olaf in charge of Dublin whilst he attacked York.

²⁴ Downham, *Viking Kings of Britain and Ireland*, p. 3.

²⁵ *Ibid.*, p. 3.

²⁶ Downham, *Viking Kings of Britain and Ireland*, p. 9; Smyth, *Scandinavian York and Dublin, II*, p. 3.

accrued aspects of mythology and descent from traditions in later sources about the legendary hero Ragnar Lothbrok, who was believed to have been of divine ancestry.²⁷ Especially in later sources such as the sagas, when the issue of lineage has become more important, the Viking kings are sometimes traced as descendants of the Norse gods.²⁸

The importance of lineage and concerns about succession in England can be seen most clearly in later sources, the writers of which were presumably concerned about the state of their own king's heirs. William of Malmesbury was writing when Henry I's sole legitimate heir was female and Roger of Wendover was writing under the unsettled rule of King John.²⁹ There is also some evidence for a contemporary feeling of the importance of royal lineage. For example, when the Vikings first gained York in 865 they ousted Osberht and installed Ælla as king of York.³⁰ In the English sources Ælla is disparagingly described as an 'unnatural' king,³¹ which Asser expands upon as 'not belonging to the royal family'.³² A similar tale is told with the unwise appointment of 'a foolish king's thegn' (*anum unwisum cyninges þegne*): Ceolwulf II was made a puppet king in Mercia for the Vikings.³³ The first attempt of the Vikings to rule had failed, not just because of the upheaval of the invading forces, but because they underestimated the importance of good ancestry in tenth-century politics according to the accounts of their enemies.

²⁷ Ibid., p.16 highlights the problems with accepting this late origin myth as a true chronicle of ninth-century events.

²⁸ MacTurk, 'Sacral Kingship Revisited', 21.

²⁹ Genealogical lists are found in *DGR*, § 126, 128.

³⁰ ASC, A, E, s.a. 867 [866]; see Rollason, *Sources for York History*, p. 57 for further discussion.

³¹ ASC, A, 'ungecyndne', E, 'ungecynde'.

³² Asser, p. 22, § 27; Swanton, ASC, p. 68n.

³³ ASC, s.a. 874 [873]; S. Coupland, 'The Vikings in Francia and Anglo-Saxon England to 911', in *New Cambridge Medieval History, c.700-c.900*, II, ed. by R. McKitterick (Cambridge: Cambridge University Press, 1995), p. 197.

Legitimisation through Association with *Romanitas*

The inheritance of royal blood was not the only important factor in early medieval kingship. The Carolingian and Anglo-Saxon kings drew important rituals and aspects of architecture, material possessions, law and bureaucracy from the Roman Empire. The Roman inheritance here is more important in the form of the concept of *Romanitas* rather than the actual handover of power from the Romans to Saxons, which is widely debated and unlikely to have occurred.³⁴ The enthronement of Charlemagne in 800 was a prime example of the importance for medieval kings of both the Roman inheritance and the sponsorship of the Pope.³⁵ The subsequent squabbles of the sons of Louis the Pious for the imperial throne shows that this remained an important issue.³⁶ Various bureaucratic and legal legacies remained or were reinstituted from the fifth century to the tenth, but the most striking legacy of the Roman Empire was the visual legacy, which European kings sought to emulate in their portraiture, their buildings and their coinage.³⁷ Figure 2.1 below shows the enduring symbolism of the imperial portrait, with the emperor or king shown in profile wearing drapery and a laurel wreath or radiate crown on his head.



Figure 2.1 Portrait coins of Diocletian and Æthelstan.³⁸

³⁴ See Rollason, *Northumbria*, pp. 65-7, for a clear summary of the debate.

³⁵ Nelson, 'Frankish Kingdoms: The West', p. 136.

³⁶ Ibid., p. 118.

³⁷ C.E. Karkov, *The Ruler Portraits of Anglo-Saxon England* (Woodbridge: 2004), p. 6.

³⁸ Spink, *Coins of England*, S.697A obv., and EMC coin 1001_569 obv.

The Legitimisation of the Viking Kingdom of York: Discussion of the Numismatic Evidence

Having looked at the concept of early medieval kingship, it is time to assess how well the Vikings of York fitted into the Anglo-Saxon and Carolingian models discussed above. The Vikings have typically been excluded from this model as they were both invaders and latecomers, and there is drastically less documentary material relating to the ideas and realities of Viking kingship. The Vikings have typically been seen as pagan invaders, more famous for their military might than diplomatic skills, hailing from Scandinavia with little claim to royal lineage. Recent work has done much to further our understanding of the chronology of the Viking kings in York, but less to enlighten us about the way those kings gained and maintained their power. Did Viking kings use the tools that other Anglo-Saxon and Carolingian kings employed to legitimise their rule? Did they use Christian symbolism, promote their military prowess, or claim a royal lineage and a cultural inheritance from the Roman Empire? The aim in this part of the chapter is to show how these aspects of the legitimisation of kingship can be examined through the medium of coins.

Numismatic Iconography as an Historical Methodology

In recent years the use of art historical methodology for looking at artefacts such as coins has become increasingly popular. The seminal work on this theme is Anna Gannon's *The Iconography of Early Anglo-Saxon Coinage*, which focuses on the sceatta coinage of

sixth- to eighth-century England and northern Europe.³⁹ These coins feature a wealth of varied imagery that had previously intrigued and mystified collectors and academics, and indeed continues to defy a coherent scheme of classification because of its varied nature.⁴⁰ The value of *Iconography of Early Anglo-Saxon Coinage* is the rigorous use of an art historical methodology as applied to coins. In her study, Gannon combines the evidence of the coins with a wealth of other artistic and documentary sources to conclude that Anglo-Saxon England was a visually alert society in which the population understood the messages enshrined in metal.⁴¹ As such, coins could have been used for official purposes, such as the support of new political ideas, as well as to express national and regional identities.⁴² She argues that coins could also have functioned didactically as a means to spread religious messages as part of the king's duty to preach the gospel.⁴³

Gannon is not alone in delving into the meaning of early medieval symbols. Scholars such as Garipzanov and Karkov have used the imagery of the English and Carolingian manuscript, charter, seal, metalwork, numismatic, sculptural and architectural evidence to understand the ideas underlying rulership in early medieval Europe.⁴⁴ Both draw upon a range of sources to gain a wider picture of their subject. Several other recent works have

³⁹ A. Gannon, *Iconography of Early Anglo-Saxon Coinage: Sixth to Eighth Centuries* (Oxford: Oxford University Press, 2003).

⁴⁰ Principle classificatory works on the sceatta series include S.E. Rigold, 'The Principal Series of English sceattas', *British Numismatic Journal*, 7 (1977), 21–30; D.M. Metcalf, *Thrymsas and Sceattas in the Ashmolean Museum Oxford* (London: Royal Numismatic Society and Ashmolean Museum, Oxford, 1993–1994); T. Abramson, *Sceattas: An Illustrated Guide; Anglo-Saxon Coins and Icons* (King's Lynn: Heritage Marketing and Publications, 2006).

⁴¹ Gannon, *The Iconography of Early Anglo-Saxon Coinage*, p. 193.

⁴² *Ibid.*, p. 2.

⁴³ *Ibid.*, p. 193.

⁴⁴ Garipzanov, 'The Image of Authority'; Karkov, *Ruler Portraits*.

also addressed the political meanings of coin design specifically,⁴⁵ and others have considered the subject of symbolism represented on material culture and how this can be interpreted, especially as regards conversion to Christianity.⁴⁶

Studying the iconography on coins is therefore already a valid means of historical enquiry, used frequently to supplement the historical record. But can the iconography of Viking coins be used to reveal the ways in which the Vikings used religion, warfare and royal lineage to legitimise their rule in York? Can these coins provide the answers that the documentary evidence cannot concerning how the Viking rulers used this ideological output to maintain, for the most part, control of the Kingdom of York? By examining the evidence in light of the themes of religion, warfare and lineage, this chapter will not only test the viability of numismatic evidence as an historical methodology, but also answer questions about the nature of Viking rule, and how they worked to maintain their political power in York.

Guthfrith (Guthred)

Guthfrith is the first Viking king of York for whom we have any evidence of coins being issued by him. His rule at York was recorded in the *Historia Regum*, where he is entitled the King of the Northumbrians, and is said to have died in 894 or 895.⁴⁷ Æthelweard's

⁴⁵ Blackburn, 'Crosses and Conversion', p. 172; A. Gannon, 'A Chip off the Rood: The Cross on Anglo-Saxon Coinage' in *Cross and Culture in Anglo-Saxon England: Studies in Honour of George Hardin Brown*, ed. by K.L. Jolly, C.E. Karkov and S.L. Keefer (Morgantown: West Virginia University Press, 2008), p. 2; Garipzanov, 'The Image of Authority', p. 198.

⁴⁶ C.B. Kendall, 'From Sign to Vision: The Ruthwell Cross and *The Dream of the Rood*' in *The Place of the Cross in Anglo-Saxon England*, ed. by C.E. Karkov, S.L. Keefer and K.L. Jolly (Woodbridge: Boydell, 2006), p. 130.

⁴⁷ *HR I*, s.a. 894; *HR II*, s.a. 894.

Chronicle expands upon Guthfrith's death, and records that his body was entombed in the high church within the city of York, which suggests he must have been a Christian to have such an honour bestowed upon him.⁴⁸ There were earlier Viking rulers at York, such as Halfdan who settled land north of the Humber in 876,⁴⁹ but if these kings issued coins, we have found no trace of them so far.

There is, however, only one known coin with the inscription *Gudeſ*, which has been argued to be a coin of Guthfrith.⁵⁰ The coin is of a basically Anglo-Saxon type with the obverse featuring the king's name and title around a small cross, and the reverse featuring the moneyer's name in two lines.⁵¹ This coin design is known as the Circumscription Cross/Two Line of Horizontal type, referring to the inscription that circumscribed a small cross on the obverse, and the inscription in two lines horizontally on the reverse, and will be referred to as Circumscription Cross/Two Line here.⁵² Guthfrith's coins superficially look very similar to Two Line type coins of Alfred, with the inscription reading *Gudeſ* rather than *Ælfred* being the main indication that this coin was issued by another ruler. The Guthfrith coin forms part of a larger group of imitative coin types that follow the Circumscription Cross/Two Line or Three Line and Portrait/London Monogram contemporary coins issued by Alfred, the latter type featuring a portrait on the obverse and the monogram for London on the reverse. These coins are also differentiated from

⁴⁸ CA, s.a. 895.

⁴⁹ ASC, s.a. 876.

⁵⁰ M.A.S. Blackburn, 'The Coinage of Scandinavian York', in *Aspects of Anglo-Scandinavian York*, ed. by R. A. Hall *et al.* (York: Council for British Archaeology, 2004), p. 327; Downham, *Viking Kings of Britain and Ireland*, p. 76.

⁵¹ M.A.S. Blackburn, 'The Ashdon (Essex) Hoard and the Currency of the Southern Danelaw in the late Ninth Century', *British Numismatic Journal*, 59 (1989), 18.

⁵² See J.J. North, *English Hammered Coinage: Volume 1, Early Anglo-Saxon England to Henry III, c.600-1272*, 3rd edn (London: Spink & Son, 1994), pl. 10, numbers 22-9 for examples of Alfred's coin types.

Alfred's issues by their poorer literacy and lighter weights, as well as their somewhat cruder execution, such as the misspelling of *Ohsnaforda* as *Orsnaforda* on Viking imitations of the Oxford type coin.⁵³ As imitative coins, the coins of the 870s and 880s were not innovative in their designs, but were issued with the aim of trying to establish a Danelaw coinage by imitation of West Saxon coinage.⁵⁴ These coins started production in the Southern Danelaw, and had presumably spread to the Northern Danelaw by the time Guthfrith reigned in the 890s.

The earliest coins merely copied Alfred's name and title, whereas later coins of Guthrum in East Anglia and Guthfrith in York began to name their own monarchs. There is little other than this epigraphic shift in the coin design to inform the historian as to the purpose and meaning behind these coins, save that the issuing authority wanted a legitimate coinage and so copied one. There are a few examples of interesting iconography; for example, one particular coin of Guthrum, struck under his baptismal name Æthelstan, copies the Carolingian Temple coins of Louis the Pious and Charles the Bald rather than the contemporary Anglo-Saxon coins, and may have been the result of borrowing dies from neighbouring Carolingian states,⁵⁵ or it may have been a more conscious decision to copy another legitimate coin that was in circulation at the time, and one that was issued by a well-known and respected authority other than Alfred.

⁵³ C.S.S. Lyon, 'Historical Problems of Anglo-Saxon Coinage (4): The Viking Age', *British Numismatic Journal*, 39 (1970), p.196; Spink, *Coins of England*, numbers 971-975.

⁵⁴ M.A.S. Blackburn, 'Presidential Address 2004. Currency under the Vikings, Part 1. Guthrum and the Earliest Danelaw Coinages', *British Numismatic Journal*, 75 (2005), p. 20.

⁵⁵ *Ibid.*, p. 26.

Siefred and Cnut

The later rulers of the 890s are, in contrast to Guthfrith, strongly represented on the coins of York, although these monarchs are virtually or totally absent from the historical record otherwise. The large numbers of these coins still extant is largely due to the fact that a vast hoard of them was found at Cuerdale in Lancashire, and the coins of Viking York from the 890s and early 900s form the largest group of coins in that hoard.⁵⁶ The kings named on this group of coins are Siefred and Cnut, who are not mentioned in the *Anglo-Saxon Chronicle*.⁵⁷ Siefred is spelled on the coins as both the Latinised *Siefredus* and the Anglicised *Sievert* on his coins.⁵⁸ There are some suggestions that a man named Sigeferth, who raided off the coast of Devon in 893, was the same man as named upon the coins of York.⁵⁹ The argument is not entirely convincing, as the Sigeferth from the Irish Annals seems to have raided the West coast of England in 893 and there is no further evidence to place him in York. It is preferable to leave the origins of Siefred a mystery rather than to attribute him to someone who may be entirely different but has a similar name, although some numismatic scholars persist in using the name of Sigeferth for Siefred.⁶⁰

⁵⁶ G. Williams, 'The Cuerdale Coins', in *The Cuerdale Hoard*, ed. by J. Graham-Campbell, British Museum Research Publications, 185 (London: British Museum Press, forthcoming), p. 43.

⁵⁷ In late 2011 a new hoard was found in Silverdale, Cumbria containing a new coin type naming Harthacnut (AIRDECNVT) as king. The hoard has been dated to c.900, meaning Harthacnut was contemporary with Cnut and Siefred, and he is also a king unnamed in any historical sources. The hoard is as yet unpublished, but the British Museum has released photographs and information on <http://blog.britishmuseum.org/2011/12/14/two-hoards-and-one-unknown-viking-ruler/> accessed on 5 April 2012.

⁵⁸ Williams, 'The Cuerdale Coins', p. 43.

⁵⁹ AU, s.a. 892 [893]; Smyth, *Scandinavian York and Dublin*, I, pp. 33-7.

⁶⁰ Downham, *Viking Kings of Britain and Ireland*, p.79; M.A.S. Blackburn, 'Currency under the Vikings, Part 2', 205.

The identification of Cnut is also problematic; there are tentative suggestions that the Cnut of these coins is the same as Hundeus who is mentioned briefly in the *Annales Vedastini* in 897 sailing down the Seine and who was baptised by Charles the Simple.⁶¹ However, the link between the two is tenuous at best, relying on transposing letters on coins in a rather random fashion or assuming that Hundeus assumed a baptismal name of Cnut, which he then placed on his coins.⁶² It is preferable to accept that both Siefred and Cnut as unrecorded kings rather than to attempt to tie them to minor Viking characters with vaguely similar-sounding names.

In fact, it could be argued that the least interesting historical enquiry about Cnut and Siefred is trying to associate them with documented people when their coins are so plentiful and visually interesting. The decoration on the coins of Cnut and Siefred, often called the 'Regal' coinages,⁶³ clearly demonstrates a Christian ethos, as the coins are decorated with a multitude of crosses. Given the triumphant recording of Guthrum's conversion by Alfred at Aller (Somerset) in 878, shortly after his defeat at Eddington (Wiltshire),⁶⁴ one might expect any subsequent conversions of Vikings, such as those of Siefred or Cnut, to have been recorded with glee. Or perhaps, since these coins were issued by the successors to Guthred, who was buried in Christian manner at York, the Christian faith was unceremoniously adopted by these kings who were his successors, so that there were no further conversions to be commented upon by the chroniclers.

⁶¹ AV, s.a. 897; C.S.S. Lyon and B.H.I.H. Stewart, 'The Northumbrian Viking Coinage in the Cuerdale Hoard,' in *Anglo-Saxon Coins: Studies Presented to F.M. Stenton on the Occasion of his 80th Birthday*, ed. by R.H.M. Dolley (London: Methuen, 1961), pp. 108-9; B.H.I.H. Stewart, 'CVNETTI Reconsidered', in *Coinage in Ninth Century Northumbria*, British Archaeological Reports, British series, 180, ed. by D.M. Metcalf (Oxford: BAR, 1987), p. 347.

⁶² Williams, 'The Cuerdale Coins', pp. 43-4.

⁶³ Blackburn, 'Currency under the Vikings, Part 2', 205.

⁶⁴ ASC A, E, s.a. 878; HR II, s.a. 878; Asser, s.a. 878.



Figure 2.2 The variety of crosses on coins of Siefred and Cnut: a) plain cross, b) cross crosslets, c) stepped cross, d) patriarchal cross e) small cross pattée which are the central motifs on many Regal coins, and are featured on both the obverse and reverse.⁶⁵ The different styles of cross on the coins of the Regal types represent both a sound knowledge of Christian symbolism, and artistic influences from as far away as the Byzantine Empire.

The variety of crosses on these coins is astonishing; plain, crosslets, stepped, patriarchal, small and large pattée are all used in an abundance and clarity unseen on the contemporary Anglo-Saxon coins. Some of this variety can be seen in Figure 2.2 above. Crosses used here were not just a standard building block of coin decoration but also a meaningful reminder of the Christian faith.⁶⁶

Some of the crosses may show the influence of Byzantine coins. The stepped cross, which can be seen on Fig. 2.2 (a and d), can be seen on coins of Tiberius II (578-82) and was the principal design on the reverse of gold and silver Byzantine coins until the mid-ninth century.⁶⁷ Elements for this stepped cross design can also be seen on Anglo-Saxon gold thrymsas of the seventh century but do not appear on later Anglo-Saxon coins.⁶⁸ So how did this design from distant coins or rare early Anglo-Saxon coins come to appear on the

⁶⁵ EMC coins: 1002_0468 rev; 1002_487 rev; 1001_0482 rev; 1029_0203 rev.

⁶⁶ Gannon, 'A Chip off the Rood', p. 155; Gannon, *Iconography of Anglo-Saxon Coinage*, p. 157.

⁶⁷ Blackburn, 'Crosses and Conversion', p. 179.

⁶⁸ Gannon, *Iconography of Anglo-Saxon Coinage*, p. 158.

Viking coins of York? The evidence of contemporary hoards shows the Vikings were using various foreign coin types as bullion from as far away as the Samanid and Abbasid empires in modern Iraq and Iran,⁶⁹ and a coin of Heraclius and Heraclius Constantine (615-30) depicting a cross on steps was found in the Cuerdale hoard deposited c.905.⁷⁰ There is an alternative possibility that the inspiration for the stepped cross on coins may have come from closer to home as the Northumbrian landscape in the tenth century would have contained many standing stone crosses in the landscape.⁷¹ There is also the possibility that the designers of these coins may have seen original Byzantine material with the stepped cross upon them. However, according to data collected about the contents of late ninth- and early tenth-century hoards, there were only two Byzantine coins buried in coin hoards around the time the coins of Cnut and Siefred were issued.⁷² However, the secondary life of many gold coins that were reused as pendants and other jewellery, meant that gold coins, such as Byzantine solidi, Carolingian tremisses and Anglo-Saxon thrymsas, may have had a longer time in circulation as jewellery than in circulation as coins. The low numbers of Byzantine coins in hoards does not, therefore, preclude the influence of Byzantine and early Anglo-Saxon gold coins as influences on design.

The patriarchal cross, which is a plain cross with an additional transverse bar above the central transverse bar, is seen on many of the coins types of Cnut and is seen as the central

⁶⁹ See Appendix IV.

⁷⁰ Lyon and Stewart, 'Northumbrian Viking Coinage', p. 99; Dolley, R.H.M., and N. Shiel, 'A Hitherto Unsuspected Oriental Element in the 1840 Cuerdale Hoard', *Numismatic Chronicle*, 142 (1982), 155-6; P.D. Whitting, 'The Byzantine Empire and the Coinage of the Anglo-Saxons', in *Anglo-Saxon Coins: Studies Presented to F.M. Stenton on the Occasion of his 80th Birthday*, ed. by R.H.M. Dolley (London: Methuen, 1961), p. 32.

⁷¹ Blackburn, *Crosses and Conversion*, p.192-3.

⁷² One Byzantine coin was found in the Cuerdale hoard.

symbol of the coin in Figure 2.3b below. The patriarchal cross also has a Byzantine precedent in the coins of Tiberius II (578-82) with the design continuing well into the ninth century on the coins of Theophilus (829-42). The influence of the patriarchal cross spread to Western Europe in the sixth century. The motif can also be seen in the so-called Luidhard's 'medalet', which was buried in Kent in the late sixth-century.⁷³ The use of the patriarchal cross after this date was not restricted to Byzantine coins and can be seen on a carpet page design in the Book of Durrow, is postulated to have been the shape of an altar-cross at Canterbury, and has been interpreted as a representation of the True Cross.⁷⁴ The patriarchal crosses used on York Viking coins do not have any specific orientation in their design with the second transverse bar appearing above or below the central bar. This suggests that if the Byzantine cross or the True Cross was an inspiration, then the correct orientation of the cross was not properly understood or enforced and that the inspiration was a very loose one.⁷⁵



Figure 2.3 Byzantine influences on Viking coin designs: a) gold coin of Theodosius III (715-17) featuring the emperor holding patriarchal cross on a globe on the obverse and a cross on four steps on the reverse, b) Viking coin of Cnut showing a patriarchal cross, c) Viking coin of Siefred featuring a cross on two steps.⁷⁶

⁷³ M. Werner, 'The Liudhard Medalet', *Anglo-Saxon England*, 20 (1991) 27; Gannon, *Iconography of Anglo-Saxon Coinage*, p. 157.

⁷⁴ M. Werner, 'The Cross-Carpet Page in the Book of Durrow: the Cult of the True Cross, Adomnan and Iona', *The Art Bulletin*, 72 (1990), 178; Gannon, *Iconography of Anglo-Saxon Coinage*, p. 158n.

⁷⁵ Blackburn, 'Crosses and Conversion', p. 188-9.

⁷⁶ Theodosius III (715-17): coin sb1487_th from <http://www.wildwinds.com/coins/sb/i.html>; EMC coins: 1001_0482 rev; 1029_0203 rev.

The other crosses on the coins of Siefred and Cnut included design elements more likely to have been derived from the British Isles. The plain or Greek cross and cross crosslet, which is a cross with all arms crossed at the terminals to form more crosses, can be seen on earlier ninth-century coins of Wessex and Mercia, which in turn were copying eighth-century Carolingian coin designs (See Fig. 2.4 below).⁷⁷ Plain and decorated crosses are also common in other artistic media and commonly form a part of the decorative carpet pages of manuscripts such as the Lindisfarne Gospels.⁷⁸

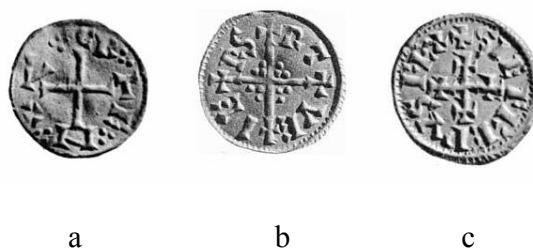


Figure 2.4 Crosses on the coins of Cnut and Siefred: a) Greek cross on a coin of Cnut, b) large cross crosslets on coins a coin of Siefred, reading SIEVERT, c) small cross crosslets on a coin of Siefred reading SIEFREDVS REX.⁷⁹ The cross forms are common on contemporary Anglo-Saxon coins of Alfred, although they tend to be much smaller in his designs. These decorated and large crosses add to the Christian meaning of these coins and were probably designed by someone with a good knowledge of Christian symbolism.

These symbolic elements of Christianity are joined on some of the coins with biblical inscriptions. The *Mirabilia Fecit, Dominus Deus Rex*, and *Dominus Deus Omnipotens Rex* coin types shown below (Fig. 2.4), all feature unique religious inscriptions with no direct English or Continental prototype. These inscriptions draw directly from the Bible,

⁷⁷ Garipzanov, 'Image of Authority', 199-200.

⁷⁸ Blackburn, 'Crosses and Conversion', p. 185; Gannon, 'A Chip off the Rood', p. 158.

⁷⁹ EMC coins: 1002_0468 rev; 1009_0128 rev; 1002_0487 rev.

with *Mirabilia Fecit* being a quote from Psalm 98 and *Dominus Deus Rex* and *Omnipotens Rex* being well-worn Biblical formulae.⁸⁰ There were, however, Carolingian coins with comparable but different liturgical inscriptions, such as those from Charlemagne onwards, with the inscription *Christiana Religio* or the inscription *Misericordia Dei Rex* found on the coins of Louis III and Odo.⁸¹ In using a Carolingian idea but adapting the actual text on the coins, the Viking coin designers were showing remarkable innovation in coin design, but more interestingly, an understanding of the use of Christian faith.



Figure 2.5 Biblical inscriptions on the coins of Cnut and Siefred: a) MIRABILIA FECIT ('He has done marvellous things'), b) D[omi]N[u]S D[eu]S O[mnipotens] REX (the Lord God almighty is king), c) D[omi]N[u]S D[eu]S REX (the Lord God is king), d) D[omi]N[u]S [Deu]S REX (the Lord God is king).⁸² These inscriptions are taken from scripture and from well-known religious phrases, and although other liturgical inscriptions appear on Carolingian coins, these particular wordings are unique and would have required an educated, possibly clerical, designer.

Another example of coins showing a familiarity with the Christian religion can be seen in the unique cruciform designs on the Cunnetti coins of Cnut, where the inscription *Cnut Rex* must be read from the top to bottom and left to right so that by reading the coin, the reader is making the sign of the cross, and the cross is a *Crux Usalis* (Fig. 2.6 below).⁸³ In reflecting knowledge of Christian practice and theory, the choice of this design perhaps

⁸⁰ Psalms, 98. 1.

⁸¹ Blackburn, 'Crosses and Conversion', p. 198.

⁸² EMC coins: 1009_0201obv; 1009_0201 rev; 1050_0165 obv; 1985_0076 rev.

⁸³ Blackburn, 'Crosses and Conversion', p. 196.

indicates the presence of a churchman in creating the design, or that Cnut was a devoted and well-read Christian himself. This cross is not the product of a pagan with little or no understanding of the Christian religion. This cross turns the coin into a part of the practice of the Christian faith; the act of reading the inscription leads the reader to make the sign of the cross themselves, and making the sign of the cross could have meant general benediction, or had other symbolic meanings, such as healing or protection from evil.⁸⁴ This fact also serves as a reminder of the materiality of the coin as an object; today we are used to seeing coins as merely monetary objects, and they are such common and familiar objects, that their designs have ceased to affect us. In medieval times it is argued that as unfamiliar and intrinsically precious objects, the cross on the coin made the coin itself a sacred object and promise of redemption.⁸⁵ Crosses on coins were not mere space-fillers but were part of designs with active and relevant meanings to all that used them.



Figure 2.6 The sign of the cross on the Cunetii coins of Cnut: by reading the sign of the cross, the coin spells out CNVT REX.⁸⁶ This particular inscription is unique to the Viking coins, and would have required a good knowledge of Christian symbolism and practice as well as an original mind to create the designs.

⁸⁴ D.F. Johnson, 'The *Crux Usalis* as Apotropaic Weapon in Anglo-Saxon England', in *The Place of the Cross in Anglo-Saxon England*, ed. by C.E. Karkov, S.L. Keefer and K.L. Jolly (Woodbridge: Boydell, 2006), pp. 81-2.

⁸⁵ Garipzanov, 'Image of Authority', 201; Gannon, 'A Chip off the Rood', p. 171.

⁸⁶ EMC coin: 1001_0482 rev.

With the Regal coins, it is almost as if, having decided to use Christian symbolism and align themselves with the Church, these Vikings gave their designers leave to go overboard with as many crosses and types of cross as possible to really emphasise their Christianity. Whether or not Siefred and Cnut were practising Christians is the subject of conjecture, but this is also irrelevant, as the impression of Christianity rather than the actual state of affairs is the key message of the coins. The combination of liturgy, Christian dedications and crosses means that religion takes centre-stage on these coins. For religion to take such a prominent role shows the importance of projecting Christianity on coins, and this is prominent even supposing Siefred and Cnut were ardent converts. The Christian symbolism on these coins cannot be taken as anything other than a desire to project Cnut and Siefred's adherence to Christianity through the mass-media of their coins. In using the symbols of Christianity these kings were purposely aligning themselves with the church at York and proclaiming not only that they were adherents of Christianity, but also that they had the support of the church in their role as kings.

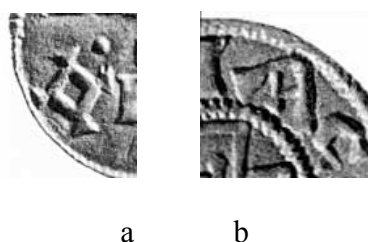


Figure 2.7 Carolingian-inspired lettering on the coins of Cnut and Siefred: a) lozenge-shaped O, b) diamond-barred A.⁸⁷ These letter forms are commonly associated with Carolingian coins that contain similarly decorated letters. However, these forms also appear on contemporary and slightly earlier Mercian and West Saxon coins of the ninth century.

⁸⁷ EMC coins: 1009_0201 rev; 1016_0129 rev.

The use of religious imagery is the most prominent feature of the coins of Cnut and Siefred, yet the designs on these coins also shows that the Vikings were imitating the designs of Carolingian coins (Fig. 2.7). But was this imitation accidental, due to the import of Carolingian mint workers, or was it a deliberate ploy to align the coins of York to the coins of the powerful Carolingian kingdoms? The coins follow the usual inscription with the king's name followed by his title in Latin following the pattern set by Anglo-Saxon and Carolingian coinages. Where these coins differ markedly from the Wessex and Mercian coins is in the use of the mint signature rather than the moneyer's name. The practice follows a Carolingian precedent and it has been argued that this influence came from the workers who may have been brought to York to work on Viking coinages.⁸⁸ Work on East Anglian and later coins of York that were signed by a moneyer has shown that many of the moneyers' names had Germanic rather than Old English elements in them.⁸⁹ If Carolingian workers were brought in to work in the York mint in large numbers this would explain the presence of these Germanic features. The lettering on these coins also bears elements of design borrowed from neighbouring coinages and writing. In particular the lozenge shaped O and distinctive barred A shown above have precedents in both the Mercian coinages of Alfred and the East Anglian mints of Ceolwulf I, as well as

⁸⁸ V. Smart, 'Not the Oldest Known List: Scandinavian Moneyers' names on the Tenth-Century English Coinage', in *Coinage and History in the North Sea World, c. AD 500-1250: Essays in Honour of Marion Archibald*, ed. by B. Cook and G. Williams (Leiden: Brill, 2006), p. 300; V. Smart, 'Scandinavians, Celts and Germans in Anglo-Saxon England: The Evidence of Moneyers' Names', in *Anglo-Saxon Monetary History*, ed. by M.A.S. Blackburn (Leicester: Leicester University Press, 1986), p. 177; V. Smart, 'The Moneyers of St Edmund', *Hikuin*, 11 (1985), p. 89.

⁸⁹ V. Smart, 'Scandinavians, Celts and Germans in Anglo-Saxon England', p. 175.

on Carolingian coins.⁹⁰ These letters in particular are decorative forms of basic letters as can also be compared to lettering found in luxury books of the eighth to tenth centuries.⁹¹

This style of lettering, taken in conjunction with the evidence of mint signatures and Germanic moneyers' names where they are given, and liturgical inscriptions would indicate a strong Carolingian influence on the coins of York. The presence of foreign moneyers raises the question of how much direct control the king had in the design of his coins. The relationship between the man who cut the dies, the man who ran the mint (the moneyer), and the king and his advisors is a complex one. The king, who may have been illiterate, would probably not have direct control of every letter form and element of design, yet it cannot be assumed that the moneyers and their die cutters had free reign on coin designs without guidance from the monarch who issued the coins. The foreign mint workers may well have used familiar letter forms, or suggested familiar coin designs, but the overall symbolism was more likely the result of deliberate policy from the rulers of York.⁹² These rulers, by the initiative of Cnut and Siefred personally, or that of close advisers who may have included senior churchmen, had created coins with heavy Christian symbolism, as well as a distinctive style, naming York as their place of production, and engraved with high quality lettering by literate and skilled mint workers employed to produce a high standard coinage. The coins of Cnut and Siefred were in many ways remarkably different to those of the contemporary Anglo-Saxon kingdoms,

⁹⁰ Spink, *Coins of England*, number 1069; North, *English Hammered Coinage*, pl. 5, numbers 14 and 21.

⁹¹ L. Webster, and J. Backhouse, *The Making of England: Anglo-Saxon Art and Culture AD 600-900* (London: British Museum Press, 1991), p. 170; C. De Hamel, *A History of Illuminated Manuscripts*, 2nd edn (London: Phaidon, 1994), pp. 15, 29, 31, for instance, the Lindisfarne and Echternach Gospels are amongst several examples.

⁹² R. Naismith, *Money and Power in Anglo-Saxon England: The Southern English Kingdoms, 757-865* (Cambridge: Cambridge University Press, 2012), p. 77.

with the variety of crosses upon them, but the unifying features of neat lettering and decorative letter forms served to show that the coinage was an official one, and that it was of a comparable quality to the coins from the Carolingian kingdoms. Design elements were used to create trust in the coinage and in the kings themselves.

Æthelwold

The coins of Æthelwold belong with those of Siefred and Cnut in terms of their style and designs (Fig. 2.8 below). Yet because Æthelwold was part of the West Saxon dynasty and was recorded in various contemporary and later texts, his coins are sometimes treated separately. Far more is known about Æthelwold than Cnut, Siefred or even some of the later Viking kings. He launched a bid for the Wessex throne when his uncle Alfred died, but he was beaten by Edward the Elder at the Holme in Bedfordshire.⁹³ Interestingly, Æthelwold seems to have used Viking military support to wage his war, and the fact that he issued coins from York in his name would suggest that he ruled in some capacity there, although the dating of his, Cnut's and Siefred's reigns are still open to debate.⁹⁴ His coins follow the types issued by Cnut and Siefred, with the Dominus Deus Rex type looking exactly the same save for the inscription AVALDVVS REX. Essentially Æthelwold's coins are the same as the Cnut and Siefred's coins, meaning that either Æthelwold was the same sort of king as Cnut and Siefred, or that he did not have much to do with the administration in York that issued coins on his behalf, and the moneyers continued to use many of the same dies from the previous reigns. Either way, Æthelwold had his name on coins, which was an important statement of his perceived right to rule the Wessex dynasty.

⁹³ ASC, A, s.a. 901 [899], D s.a. 904 [902], C, s.a. 905 [904].

⁹⁴ Downham, *Viking Kings of Britain and Ireland*, pp. 79-82.

Æthelwold was the son of Alfred's older brother Æthelberht, who had reigned between 858 and 865/6, and as a man of royal lineage in a time before the right of succession necessarily went to the eldest son, had a good claim to the throne and some supporters to pursue it. It is interesting then that even Æthelwold, with a relatively strong claim to the Wessex throne felt it was important to issue coins with his name upon them. It appears that legitimacy was not just about claiming a throne or fighting for one, but also involved promoting this through coins.

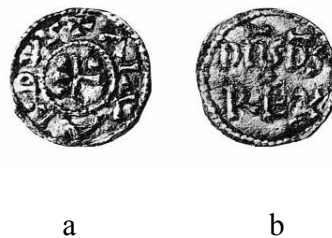


Figure 2.8. Coin of Æthelwold: a) obverse reads ALVALDVS, b) reverse reads D[omi]N[u]S D[eu]S REX.⁹⁵ Æthelwold's coins re-use reverse dies from the coinages of Cnut and Siefred, either because there was no time to cut new dies, or Æthelwold did not mind which reverses were used, so long as coins were issued with his name on the obverse.

The Swordless St Peter Coins

Following the Regal coins and the reigns of Siefred, Æthelwold and Cnut, there is a remarkable lack of evidence for any rulers in York both in the documentary and numismatic record. The coins of c.905 to c.919 from York are anonymous and name no king.⁹⁶ The documentary sources are equally opaque, with tantalising references to the deaths of several Viking leaders, especially in the battle fought on behalf of Æthelwold.⁹⁷

⁹⁵ EMC coin: 1004_583 obv and rev.

⁹⁶ Rollason, *Sources for York History*, p. 66.

⁹⁷ DGR, § 125.

The documentary sources giving evidence as to who was ruling York are mainly limited to accounts of a few key events, namely the Peace at Tiddingford in 906 and the Battle of Tettenhall in 910.⁹⁸ The reports of Peace of Tiddingford are brief and appear after some apparent struggles, in which many Viking jarls, as well as some Anglo-Saxon ealdormen, died.⁹⁹

The list of the dead during Æthelwold's rebellion includes many Vikings, and likewise the list of the dead at Tettenhall is fairly long. The *ASC* lists the fatalities as Kings Eowils, Halfdan and Ivar who are unknown elsewhere in the texts and evidently produced no coins. The Halfdan of Tettenhall is unlikely to be the same Halfdan who settled in Northumbria and ploughed the land in 875 as he would by this time be an old man, as would his relative Ivar, who was also active in the 860s and 870s.¹⁰⁰ However, it has been argued that both the Halfdan and Ivar who died at Tettenhall were indeed this earlier generation of Viking leaders and provided continuity in the dynasty of Ivar, but due to their age and the active participation in warfare in the 910s, it is more likely that these are different men.¹⁰¹ If the sources are to be taken at face value, we are to believe that York in 910 was ruled by two kings, Ivar and Halfdan, and an anonymous coinage was issued under them. However, the documentary sources are quiet on who ruled York after this battle, and the Swordless St Peter coins are really the only contemporary evidence. The texts for this period c.905 to c.919 are not particularly enlightening on the subject of who,

⁹⁸ Tiddingford: *ASC*, *A*, *D*, *E*, s.a. 906, *HR II*, *HR I*, s.a. 906; Tettenhall: *ASC*, *A*, *D*, s.a. 911 [910], *C*, s.a. 910, *HR II*, *NR*, s.a. 910; Chester: *ASC*, *C*, s.a. 907, *HR II*, s.a. 908.

⁹⁹ *ASC*, *A*, s.a. 905 [903].

¹⁰⁰ *ASC*, *A*, *E*, s.a. 876 [875].

¹⁰¹ Downham, *Viking Kings of Britain and Ireland*, p. 87.

if anyone, was ruling York at the time. They are very vague on the subject of the chronology of the kings of York for this date, and tell almost nothing about who was ruling York, or more importantly, how it was ruled. The historian is once again left with coins as the most prolific source for the period c.905 to c.920 in York, but can the numismatic evidence expand upon this evidence?

Given the lack of historical references to living kings ruling York in this period, it would be tempting to conclude that the Viking Kingdom of York was not in fact a kingdom at all, but ruled by some other authority, perhaps the church that had been so instrumental in Cnut and Siefred's coin designs. The lack of a regnal authority on the coins of this period would initially seem to bolster this argument, as surely a king would proclaim his name on his coins. However the right to strike coins, and in particular the regal monopoly upon that right was rarely surrendered in medieval England where it was gained. As Blackburn has argued, it would be highly unlikely for any king to give his minting rights to another authority unless all was lost.¹⁰² Minting coins was more than a tool for promoting messages through designs; it was an extremely lucrative source of income for any monarch, with later medieval monarchs receiving a seignorage of six to eleven pence per pound of coins minted.¹⁰³ It is in this light that the Swordless St Peter coins of Viking York will be considered even though they name no king upon them.

¹⁰² Blackburn, 'Coinage of Scandinavian York', p. 333.

¹⁰³ Craig, *The Mint*, p. 423, the figures are for silver coins minted between 1280 and 1349.

Although there are fewer extant Swordless St Peter coins than coins of Cnut, Siefred and Æthelwold, the coins are still more numerous than any other Viking coin type.¹⁰⁴ Within the Swordless St Peter coin type, there is enormous variation in the layout and adornment within the same basic design. The basic design of these anonymous coins is not as prominently Christian as that of the preceding coins, but there are still some symbolic elements of the Christian faith that appear on them. The basic Two Line design and Circumscription Cross reverse is similar to the one seen on coins of Alfred and Edward the Elder. To some extent, the motifs that fill the space between letters are similar on Viking coins to their prototypes, and consist mainly of crosses pattée and pellets. These additional motifs are regular enough to have formed the basis of a categorisation of tenth-century coins by Blunt, Lyon and Stewart.¹⁰⁵ What distinguishes the Swordless St Peter coins from their Anglo-Saxon exemplars is the range of additional motifs such as stars, keys, crosses and various symbols, which were used throughout the coinage to fill the space above and below the legends (Fig. 2.9).

¹⁰⁴ See Blackburn, 'Currency under the Vikings, Part 2', 216 for a summary of extant coin numbers. The estimated volumes of the Viking coinages of York will be discussed in full in Chapter 3.

¹⁰⁵ C.E. Blunt, B.H.I.H. Stewart and C.S.S. Lyon, *Coinage in Tenth-Century England: From Edward the Elder to Edgar's Reform* (Oxford: Published for the British Academy by Oxford University Press, 1989), pp. 10-19. This classification scheme with some additional coin type information is summarised in Appendix I.

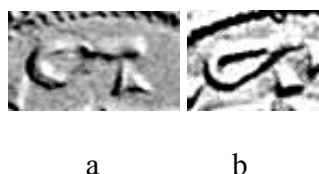


Figure 2.9 Keys on the Swordless St Peter coinage: a) key based on a contraction mark, b) looped key where the key design has begun to replace the contraction mark function of the symbol.¹⁰⁶ The Swordless St Peter coinage was issued for about fourteen years, during which time the standard of literacy fell, and symbols, such as the key, had a greater prominence in the design, as all the letters of the inscription ceased to be included.

Some of these symbols have obviously developed from the contraction mark above the SCI which is seen on several very literate coins. Other coins appear to have used this contraction mark as a decorative feature with the addition of a small loop and chevron, as seen in Figure 2.9a, to form a small key. This embellishment turned a mundane contraction mark into one of the attributes of St Peter, to whom the Church at York, and this issue of these coins, is dedicated. This key gradually developed a more looped shape over time and is found in various positions on the coin design, not just above the contraction SCI. The contraction mark ceased to be bound by the conventions of literacy and the form of the key became more important than the function of the contraction mark.



Figure 2.10 Branch-shaped symbols of the Swordless St Peter coins: a) Branch shape, b) double branch.¹⁰⁷ The branch or double branch design appears on 15 out of the 138 reverse dies known, and is the second most popular additional symbol after the key.¹⁰⁸

¹⁰⁶ *EMC* coins: 1020_689 obv; 1029_0415 obv.

¹⁰⁷ *EMC* coins: 1026_0033 obv; 1004_0606 obv.

¹⁰⁸ See Appendix I.

Other symbols, such as the branch shape, do not have such an easy point of origin. This symbol appears as a single branch and a pair of branches piled atop each other (Fig. 2.10b). It may be the Greek letters psi (Ψ) or a lower case omega (ω), and again referencing such Christian ideas as the use of alpha or omega is not unprecedented on coinage. Christograms frequently appeared on Byzantine coins and are seen on Merovingian coins,¹⁰⁹ as well as on the Byzantine-influenced Beneventan coinages from Italy.¹¹⁰ But the branch does not really look like an omega, and this explanation does not adequately explain the double branch. Another interpretation is that the branch is an image of Church paraphernalia, such as a candelabrum or a cross with candles on the arms. Both the omega and candelabrum interpretations would suggest an understanding of Christian symbolism and decoration on the part of the moneyer or by the issuing authority. With the Swordless St Peter coin type, it is likely that the kings of York maintained control of minting, but worked closely with an ecclesiastical figure as their predecessors Cnut and Siefred had done. It has been suggested that the religious dedication on the coins indicates they were issued by the Church at York, but as mentioned above, kings are unlikely to have given up the prerogative to mint, and the symbolism on these coins is no more Christian than that used in the cases of Cnut and Seifred, who are named on their coins.¹¹¹

¹⁰⁹ Garipzanov, 'Metamorphoses of the Early Medieval Signum of a Ruler in the Carolingian World', *Medieval Europe*, 14:4 (2006), 459.

¹¹⁰ P. Grierson and M.A.S. Blackburn, *Medieval European Coinage, with a Catalogue of the Coins in the Fitzwilliam Museum, Cambridge. Volume 1: The Early Middle Ages (Fifth to Tenth Centuries)* (Cambridge: Cambridge University Press, 1986), p. 69.

¹¹¹ Rollason, 'The Evidence of Historical Sources', p. 313.

Alternatively, this mysterious symbol could be an allusion to an entirely different religion, and may refer to sacred trees of earlier pagan Europe, one of which was the Yggdrasil of the thirteenth-century Poetic and Prose Eddas by Snorri Sturlusson.¹¹² Given the overwhelmingly Christian decoration of the Regal coinages and the Christian inspiration of the Swordless St Peter coins from their Anglo-Saxon exemplars, the dedication to a Christian saint, as well as the addition of the key of St Peter, a pagan symbol is highly unlikely. The Christian tradition also has a trees and tree-like symbols that could be the inspiration for this branch motif. Living crosses or *Crux Foliata*, which were crosses covered in foliage in the form of vine scroll, would have been seen as an element of stone sculptures across the Northumbrian landscape in the tenth century, increasingly uninhabited by creatures as they had been in earlier sculptural art.¹¹³ Vine scroll itself was also a common reference to Christ's declaration 'I am the true vine' and featured prominently on ninth- and tenth-century Northumbrian stone sculptures.¹¹⁴ The concept of the uprooted tree can be seen in Anglo-Saxon riddles and poems such as the *Dream of the Rood*, in which the cross upon which Christ was crucified laments remorsefully upon how it has been used as the implement of Christ's death.¹¹⁵ It is therefore most likely that this symbol is a tree or an omega (and double omega) even though both interpretations have problems which have been discussed above; either way it was a Christian symbol. The Swordless St Peter coins, issued by a king or kings whose names are unknown, featured

¹¹² H.E. Davidson, *The Lost Beliefs of Northern Europe* (London: Routledge, 1993), pp. 68-9.

¹¹³ D.M. Wilson, *Anglo-Saxon Art: From the Seventh Century to the Norman Conquest* (London: Thames and Hudson, 1984), p.149; Webster and Backhouse, *The Making of England*, p. 209; I. N. Wood, 'The Cross in the Landscape', in *The Place of the Cross in Anglo-Saxon England*, ed. by C.E. Karkov, S.L. Keefer and K.L. Jolly (Woodbridge: Boydell, 2006), p. 7.

¹¹⁴ John 15. 1-17; see R. Cramp, *Grammar of Anglo-Saxon Ornament: A General Introduction to the Corpus of Anglo-Saxon Stone Sculpture* (Oxford: Oxford University Press, 1984), p. xxiv.

¹¹⁵ Gannon, *Iconography of Anglo-Saxon Coinage*, p. 94; Kendall, 'The Ruthwell Cross and *The Dream of the Rood*', p. 130.

Christian symbolism that permeated the design of the coin down to the space-filling marks additional to the main dedication inscription. As with the coins of Siefred and Cnut, these coins show that Christianity was understood to be the religion of legitimate kings, and the kings who issued this coinage could have been advised on the design by knowledgeable churchmen, and showed the support of the church as well as their religion through the issue of these coins.

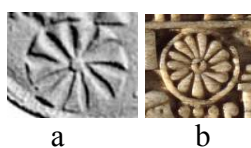


Figure 2.11 Star symbol on Swordless St Peter coins and other media: a) star symbol, b) the marigold on the Franks Casket.¹¹⁶ The star symbol appears on only a few of the 138 known dies, and is as such a rare symbol on these coins.

Stars and crosses are other symbols that are featured on these coins. The crosses on the Swordless St Peter coins are less varied and elaborate than those on the coins of Cnut and Siefred. The crosses in the field of these coin designs are additional decoration, as on the Anglo-Saxon designs they copy, and not the main motif, as with the earlier coins. The lack of space in the field of the coin left for such additional symbols meant that there was not enough room for elaborate cross crosslets, stepped crosses and patriarchal crosses. The die engravers or moneyers seem to have preferred other ways of elaborating their coins, such as the key of St Peter or the branch shape. One coin features a large star, which does not have an overt Christian message, but is a feature on other coins, notably on the much later Two Stars type of William I. Classical motifs may be behind the use of the

¹¹⁶ EMC coin 1020_0694 obv; Frank's casket, front, image from http://www.britishmuseum.org/explore/highlights/highlight_objects/pe_mla/t/the_franks_casket.aspx [accessed on 6 September 2011].

star and they are found on thrymsas of the seventh century.¹¹⁷ The star could also be a marigold motif, a type of complex cross also seen on classical and Anglo-Saxon illuminated books and sculpture.¹¹⁸ The star featured on the Swordless St Peter coins has many rays and looks quite similar to the marigold on the Franks Casket, illustrated above in Figure 2.11 above. However, with the star only present on one coin, there is a danger of reading too much into the interpretation of a single motif. The additional crosses certainly carry the Christian message on these coins, and the star may possibly also perform this function.

The layout of the obverse of these coins themselves can also be interpreted as a cross, as the two lines of text are adorned by five minor symbols, most usually pellets or crosses. This decoration appears on contemporary Anglo-Saxon coins, and has formed the basis for classification of Two Line/Circumscription Cross types, which has been adapted here for the Swordless St Peter coinage.¹¹⁹ These elements generally form a cross and the importance of this element is easily overlooked in favour of more attention-grabbing details, such as the keys, stars or lettering on the coins. It has been argued that the frequent presence of five symbols in the design of some sceattas represents the five wounds of Christ.¹²⁰ Such an interpretation is interesting, but if any meaning was intended, it was not an original Viking design. The Two Line design of these coins was copied from the main Anglo-Saxon coin type from Alfred and his successors. Also many of the Swordless St Peter coins feature fewer than five additional symbols, and this number decreased over

¹¹⁷ Gannon, *Iconography of Anglo-Saxon Coinage*, p. 74.

¹¹⁸ *Ibid.*, p. 166.

¹¹⁹ Blunt, Stewart and Lyon, *Coinage in Tenth-Century England*, pp. 10-19. See Appendix I.

¹²⁰ Gannon, 'A Chip off the Rood', p. 161.

time as large symbols, such as looped keys or large stars and crosses, took over space. The five symbols may have been an important element of the design, but it appears that they were less important than other symbols.

The clustering of pellets is also found on the Swordless St Peter coins, both as part of the cruciform small symbols dividing the inscription, and as decoration around a large cross on one coin. It has been argued that when clusters of pellets appear on sceattas, they may represent clusters of berries, which are analogous to clusters of grapes as seen in the Book of Kells, and on a lot of Anglo-Saxon sculpture.¹²¹ The use of the trefoil is another symbol copied from contemporary Anglo-Saxon coins and could, indeed, have this Christian meaning. Alternatively, this decoration appears to be in the tradition of Anglo-Saxon carpet pages, in which letters are surrounded, and gaps filled, by pellets from a *horror vacui*.¹²²

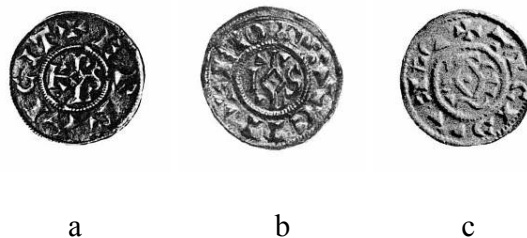


Figure 2.12 The Karolus monogram on Swordless St Peter and Rægnald coins: a) Swordless St Peter, EBRAICIT, b) Rægnald Hand type, EORACIIT, c) Rægnald Hand type, TICIDAE.¹²³ The Karolus monogram is generally copied faithfully on the Swordless St Peter coins, but on the coins of Rægnald, the letters of the monogram are frequently transposed or retrograde.

¹²¹ Gannon, *Iconography of Anglo-Saxon Coinage*, p. 163.

¹²² Wilson, *Anglo-Saxon Art*, p. 10.

¹²³ EMC coins: 1004_0599 rev; 1004_0625 rev; 1001_0516 rev.

The Swordless St Peter coins and some of the coins of Rægnald share the use of the *Karolus* monogram as a central motif on the reverse, as can be seen in Figure 2.12 above. The monogram on the Swordless St Peter coin (Fig. 2.12a) has its elements in the correct places, whereas the Rægnald coin (Fig. 2.12b) has the central squared O, the S to the right and the L below, but the C and R are blundered. Other Rægnald *Karolus* monogram reverses show similar blundering of the legend, which suggests that this monogram was copied from the earlier Swordless St Peter coins as a decorative feature rather than with any understanding of what the symbol meant. The better renditions of the monogram on the Swordless St Peter coins suggest that the monogram may have been adopted from Carolingian coins. This may have been done with a full understanding of what the monogram meant, seeing it merely as a symbol of strong kingship, rather than the *signum* of a particular king.¹²⁴ The general literacy and symbolic elements on the Swordless St Peter coinage suggest that the coinage was designed by, or had design input from, someone familiar with the Church, perhaps a prominent York figure such as the archbishop. Someone of this educational level would understand the implications of the monogram, and since during this period we have so little information of the kings ruling York, it is possible that Charles is the baptismal name of a Viking king who was ruling at this time. Given the lack of evidence of Viking rulers at this time it could be possible that a king at York was baptised as a Christian and proudly bore his monogram on his coins.

The anonymous Swordless St Peter coins were made at a time that has been interpreted by many historians as something of a power vacuum in York. This is because the documentary sources provide very little information about who reigned in York at this

¹²⁴ Garipzanov, 'Metamorphoses of the Early Medieval Signum', p. 421.

time, save for several dead Viking leaders on a couple of battlefields. The coins, and specifically the designs upon them, show that thought and care went into their creation, as well as a detailed knowledge of Christian symbolism. Towards the end of the 910s the control of the designs seems to have slipped somewhat, with some design elements growing at the expense of others, which may indicate that the production of the dies for the coins was not being monitored as closely as in the 900s, or that less skilled engravers were cutting the dies. It has been argued that these coins must have been issued by a Viking king, since monarchs rarely gave up the exclusive right to mint coins once they had earned it, and it has also been argued that the explicit Christianity of these coins indicates an ecclesiastic issuing authority.¹²⁵ The lack of a regnal authority named upon the coins is the only evidence in this coin type that is suggestive of a lack of royal authority, and this has often been used to support the impression given by the lack of textual evidence for a monarch at the time.¹²⁶ However, taken together with the evidence of the preceding coin types of Cnut and Siefred, there is a consistent amount of Christian imagery upon both coin types. The Swordless St Peter coins show that Christian symbolism was used to legitimise the rule of the kings of York at the time, both by presenting Christianity as the faith of the ruler, and by proclaiming the support of the Church at York through the use of a religious inscription rather than a regnal name and title. The coins also combined elements from Carolingian coins, such as the use of Biblical inscriptions and the *Karolus* monogram, which served to both instill trust in the coinage through familiarity with a known coin type, and also by claiming some sort of association with that kingdom.

¹²⁵ Blackburn, 'Coinage of Scandinavian York', p. 333; Rollason, 'The Evidence of Historical Sources', pp. 313-4.

¹²⁶ Rollason, 'The Evidence of Historical Sources', p. 313.

Rægnald

Like the preceding twenty years, the reign of Rægnald is not closely documented by the historical sources. Rægnald appears in a variety of sources, under various names. He is not generally considered to be the King Reinguald who divided the land of St Cuthbert in 899, instead Rægnald seems to first feature in the sources in the mid 910s when he was involved in the Battle of Corbridge.¹²⁷ He is known to have captured York in 919, but the uncertainty over the dates for the Battle, or Battles, of Corbridge means that he may have been ruling York much earlier.¹²⁸ There has been discussion over when Rægnald arrived in York, arising because there is confusion in the primary sources as to whether there were one or two battles at Corbridge, as recorded in the *Historia de Sancto Cuthberto*. Wainwright argued for two battles that took place in 914 and 918, whereas modern scholars, such as Downham and Johnson South, have argued for only one battle in 918, and others, such as Rollason, have argued for a single battle in 914. The argument for only one battle having occurred in 918 is that the earlier battle of 914 was a mistake in a portion of the *Historia* which contained other chronological errors.¹²⁹ In Rægnald's later career at York, he was one of several kings who in 920 where he acknowledged Edward the Elder as father and lord.¹³⁰ However, Edward's overlordship over Rægnald and the Northumbrians, the Scots and the Strathclyde Britons must have been of the sort which enabled kings to continue to rule their own lands and issue their own coins.

¹²⁷ Rollason, *Sources for York History*, p. 66; *HSC* §22.

¹²⁸ *HR I*, p. 92.

¹²⁹ F.T. Wainwright, 'The Battles at Corbridge', *Saga-Book of the Viking Society*, 13 (1946-53), 156-73; Downham, *Viking Kings of Britain and Ireland*, p.93; Johnson South, *HSC*, p. 159; Rollason, *Sources for York History*, p. 66.

¹³⁰ *ASC*, A, s.a. 924 [920], F, s.a. 923.



Figure 2.13 Hand symbols on tenth-century coins: a) Edward the Elder, Benediction Hand type, ALIISTAN MO, b) Edward the Elder, Benediction Hand type, EADRED MO, c) Rægnald Hand type, RACIIOAT, d) Rægnald Hand type, IACIIOIT, e) Rægnald Hand type, RANOCIT.¹³¹ The hand appears slightly differently on all known Hand coins of Rægnald, as they are all made from different dies. Nonetheless, it is clear that the symbol does represent the Benediction Hand as featured on the coins of Edward the Elder rather than a glove of Thor, as was suggested by antiquarians and numismatists in the nineteenth century.¹³²

To further understand the reign of Rægnald, the numismatic evidence for the period, c.919 to 920/1 can be used. Unfortunately, the coins of Rægnald are not nearly as numerous as those of the preceding Swordless St Peter type or even the subsequent series of the 920s.¹³³ Although we might expect a small number of coins to have been made in only the two or three years in which Rægnald ruled York, the twenty-three known coins of Rægnald constitute a meagre sample by any standard. There were three coin types issued under Rægnald's name, none of which uses any regal title upon the inscription. These are the Hand type, the Portrait type and the Bow and Arrow/Hammer type. This means that

¹³¹ EMC coins: 1016_149 rev; 1020_0762 rev; 1004_0622 obv; 1004_0625 obv; 1016_0123 obv.

¹³² D.H. Haigh, 'The Danish Kings of Northumberland', *Archaeologia Aeliana*, 2nd ser., 7 (1876), 69.

¹³³ See Blackburn, 'Coinage of Scandinavian York', p. 343 for a comparison of known coins and dies for the Vikings at York.

the small sample is spread thinly over three different coin types.¹³⁴ One coin type features a hand, which could be seen as the product of Christian influence. This Hand type coin has been frequently discussed,¹³⁵ but opinions on the design tend to fall into two camps, that the hand is a representation of the Hand of God or Benediction Hand, or that it is in fact a representation of the Glove of Thor.¹³⁶ This iron glove was one of the main attributes of the god Thor, which he used to handle his hammer.¹³⁷ Both interpretations can be understood by looking at the variety of designs appearing on the coin as shown in Figure 2.13 above. Some hands look distinctly glove-like, such as 2.13c, which seems to have a cuff, whereas the others look like a bare hand. By comparing Rægnald's coins to Edward the Elder's Benediction hand coins it is also possible to suggest where inspiration may have come from. The hands on Edward's coins have been seen as functioning as an apotropaic and sign of benediction, from both the king and God towards the person who looks at the coin.¹³⁸ Even the cuff of the so-called Glove of Thor can be interpreted in this way in comparison with the benediction hand if the curved 'cuff' is in fact a line of clouds as the hand descends from the heavens, as can be seen in Figure 2.13b, although the coin in Figure 2.13a looks a little more problematic, with some suggestion of clouds, but also a decorated cuff on the wrist. The idea of this Glove of Thor arose in antiquarian

¹³⁴ For a corpus see C.E. Blunt and B.H.I.H. Stewart, 'The Coinage of Regnald I of York and the Bossall Hoard', *Numismatic Chronicle*, 143 (1983), 146-63.

¹³⁵ Blunt, Stewart and Lyon, *Coinage in Tenth-Century England*, p. 105 refuse to commit themselves either way.

¹³⁶ J. Rashleigh, 'Remarks on the Coins of the Anglo-Saxon and Danish Kings of Northumberland', *Numismatic Chronicle*, 2nd ser., 9 (1869), 81; C. Oman, 'The Danish Kingdom of York, 876-954', *Archaeological Journal*, 91 (1934), 12.

¹³⁷ R. Simek, *Dictionary of Northern Mythology*, trans. by A. Hall (Cambridge: Brewer, 1993), p. 219

¹³⁸ Gannon, *Iconography of Anglo-Saxon Coinage*, p. 63.

numismatic texts and has continued to be influential.¹³⁹ But it is quite clear that the hands on Rægnald's coins are imitations of Edward's coins, just as the *Karolus* monogram was clearly copied from the Swordless St Peter coins. This indicates that the policy of overt Christian imagery on the coins of Cnut and Siefred and the Swordless St Peter coins was still pursued under Rægnald. However, this was done in a less original manner than the previous coin types, and largely copied Edward's coin designs, meaning that Rægnald may have not had such a close relationship with the Church as his predecessors. Instead, he showed his religious affiliation through imitating the Benediction Hand coins, which also served to align him with Edward the Elder, to whom he had promised allegiance in 920.

Another of Rægnald's coin types also has an Anglo-Saxon inspiration; the Portrait type copies the idea, if not quite the stylistic level of execution, of contemporary coins of Edward the Elder. In using a portrait, which even when well executed on Saxon coins, was merely a stylised representation of a king rather than an actual portrait of a particular monarch, Rægnald's coins proclaim him to be on par with Edward.

¹³⁹ Rashleigh, 'Remarks on the Coins Northumberland', 79; Smyth, *Scandinavian York and Dublin*, II, p.107; Blunt, Stewart and Lyon, *Coinage in Tenth-Century England*, p. 105.



Figure 2.14 Portraits on Roman, Anglo-Saxon and Viking coins: a) Diocletian, b) Edward the Elder, and c) Rægnald.¹⁴⁰ The Anglo-Saxon coins copy the conventions of imperial portraiture, showing the king's portrait in profile, wearing a diadem and draped robes. Rægnald's portrait is not lifelike, but the ribbons of his diadem can still be discerned.

It becomes especially apparent when looking at the Portrait type coins of Edward and Æthelstan that the Roman concept of an emperor or king was still current under the Anglo-Saxons, and to some extent under the Vikings as well. Figure 2.14 above shows portrait coins of Anglo-Saxon and Viking kings. All feature the figure shown in profile with a diadem of some sort, and the idea of a regal portrait on a coin can be seen being copied from the Romans by the Anglo-Saxons, and then by the Vikings, with a loss of naturalistic artistic engraving accompanying each copy. However, Rægnald's Portrait type coins are exceedingly rare, and known from only three coins each from a unique die.¹⁴¹ Both the Portrait and Hand types closely follow contemporary Anglo-Saxon coin types, but the coins they copy are not the main issues of Edward the Elder, but rarer types. The Portrait type was less common than the main Circumscription Cross issue, and the Benediction Hand type was a rare issue minted in Chester. Rægnald seems to have chosen the more decorative coin types with which they were familiar to adapt and reproduce, albeit with the work undertaken by a die cutter with inferior engraving skills. Although both the Hand

¹⁴⁰ Spink, *Coins of England*, S.697A obv., EMC coins 1001_578 obv; 1009_226 obv.

¹⁴¹ Blunt and Stewart, 'Coinage of Regnald', 147.

and Portrait types of Rægnald copy Anglo-Saxon types, the types chosen are ones with interesting imagery relating to both Christianity and a Roman inheritance; Rægnald did not choose to copy the less ornate Two Line types of Edward's coins. This indicates that perhaps association with the Anglo-Saxon king was not the main aim of this coinage, although the familiarity with Anglo-Saxon types was certainly no hindrance to the acceptance of a coin type, but it was the ideological statements about religion and the right to rule that were chosen for these coins.



Figure 2.15 Rægnald's Bow and Arrow/Hammer type. Obv: RAROICIT, rev: IOIATRAC.¹⁴² The Bow and Arrow/Hammer type was a bold new departure in coin design, featuring new imagery not seen on any other coins before.

There is one truly striking coin issue of Rægnald, which is the Bow and Arrow/Hammer type. Both the obverse and reverse sides of these coins have innovative designs, not seen elsewhere on contemporary or earlier coins issued by any kingdom. It has been argued that the bow and arrow were an expression of Viking military prowess and was representative of the Vikings as a warlike people. In choosing the bow and arrow, the designers of this coin type were making a powerful statement about their military ability, one which other kings, such as Edward the Elder, chose not to make upon their coins. This coin type of Rægnald goes beyond proving military prowess through warfare, and could reflect the aim of showing the military might of his kingdom through symbols. The coins of Rægnald go beyond even the emperors in armour seen on some Roman coins by

¹⁴² EMC coin 1009_0226 obv; North, *English Hammered Coinage*, pl. 8, number 24.

just showing a weapon to legitimise his rule in York. Rægnald may not have actually been more powerful than Edward the Elder, but his coins proclaim that he was a powerful warrior nonetheless. The reverse of this coin type features a Thor's hammer, which is the first example on Viking coins of a symbol reflecting a religion that is not Christianity. The hammer, as shown in Figure 2.15 above has also been interpreted as a Tau cross, and given the heavy Christian symbolism on the coins of Rægnald and his predecessors, this would seem a reasonable interpretation. However, the use of this symbol on some coins of the 920s, and the use of a symbol that more clearly resembles a hammer than a Tau, has led to the interpretation of this as Thor's hammer.¹⁴³ The ambiguity between the Tau and the hammer may well have been deliberate as a tool for conversion, by which the similarities in the properties and uses of cross and hammer as a symbol of religion were highlighted. The hammer of Thor was a powerful attribute of this god through which he was able to produce lightning.¹⁴⁴ An indication of the use of the hammer as a tool of conversion can be seen in its use as a pendant amulet, as these objects have been found widely in Scandinavia and also in some numbers from tenth-century England.¹⁴⁵

But was the hammer a purely pagan symbol? It has been argued that Rægnald was part of the dynasty of Ivar,¹⁴⁶ but the fact that imitative Hand and Portrait coinages were followed by this startling departure from previous iconography suggest that there had been some fundamental change in the role the king played in the design of his coinage. The

¹⁴³ Haigh, 'Danish Kings of Northumberland', 69.

¹⁴⁴ Davidson, *Lost Beliefs of Northern Europe*, pp. 81-2.

¹⁴⁵ M.A.S. Blackburn, 'The Viking Winter Camp at Torksey, 872-3', in *Viking Coinage and Currency in the British Isles*, ed. by M.A.S. Blackburn (London: British Numismatic Society Special Publications, forthcoming), p. 224; and PAS finds SWYOR-489283, NMS-A9E816, LANCUM-ED9222.

¹⁴⁶ Downham, *Viking Kings of Britain and Ireland*, pp. 94-5.

Swordless St Peter coins had mostly been issued to a high standard at first, but over time there had been a noticeable decline in the quality of engraving and inscriptions, as well as a lack of uniformity being enforced in the coin design.¹⁴⁷ This lack of minting control manifested in variation in the coin designs appears to have continued in Rægnald's early coinages. The Bow and Arrow/Hammer coinage with new military and religious symbols featuring prominently may have been intended to introduce new iconography and assert administrative control of the minting process. Was this new attitude of independence that prompted Edward's burgh-building in the Peak district, or did Rægnald choose to establish and proclaim his independence from Anglo-Saxon rule through his coins despite his submission to Edward as overlord? These questions will probably remain unanswered unless large numbers of new Rægnald coins are discovered. Rægnald was dead by 921, but despite the fact his bold iconographic statements did not last for long, the symbols used within the coinage show that there was an agenda to legitimise his rule in York. The departure from the heavy use of crosses and biblical inscriptions was replaced by imitations of some of Edward the Elder's more spectacular coin types. The Hand and Portrait coin types show an interest in legitimising Rægnald's rule through emphasising his links with the Anglo-Saxon king, but also proclaiming his Roman heritage and Christian ideals. It appears that circumstances changed for Rægnald and his last coin type showed strong war-like imagery in order to proclaim his military strength, and this was combined with an image relating to a Norse God. This rejection of the religion of the Anglo-Saxon kings was tempered somewhat by the style of hammer being ambiguous and able to be interpreted as a Tau cross, but this new coin type was a sign of a Viking king

¹⁴⁷ Blackburn, 'Coinage of Scandinavian York', p. 333.

who perhaps saw himself as strong enough to be able to reject the Christian religion to legitimise his rule, and to focus upon his perceived military strength instead.

Sihtric and the Sword Coin Types

After the absence of information concerning the rulers of York and the confused chronology of the first two decades of the tenth century, the reign of Sihtric, for which there exists in the texts a more secure chronology and evidence of some interaction with Æthelstan, has provided fertile ground for historical interpretation.¹⁴⁸ The marriage treaty between Æthelstan's sister and Sihtric, which was conducted in Tamworth in 924, is seen as the key event for Sihtric's reign. The report of marriage treaty in the *Anglo-Saxon Chronicle* and other sources has been viewed as evidence for the precarious state of the Viking kingdom in the 920s compared to the assured power of Æthelstan, who was able to invite the Viking king to the heart of Mercia.¹⁴⁹ According to this interpretation, Sihtric travelled to the heart of Mercia to conclude a treaty that tied him to the West Saxon dynasty, and that enabled Æthelstan to take the throne at York upon his death, in the same way that Æthelflæd's marriage to Æthelred I had enabled Edward to annex the Mercian kingdom upon her death.¹⁵⁰ An alternative interpretation of the meeting is that it is evidence that Æthelstan's power was in fact weak at this point, with Tamworth on the border between kingdoms and chosen as a neutral meeting place. In this case the treaty could be seen as an agreement between two equally powerful kings, which presumably gave Sihtric the same rights to the Wessex throne that Æthelstan claimed for York. With

¹⁴⁸ Rollason, *Sources for York History*, p. 67.

¹⁴⁹ Rollason, *Northumbria*, p. 262.

¹⁵⁰ Smyth, *Scandinavian York and Dublin, II*, p. 9.

the historical reports of this marriage treaty open to contradictory interpretations, the numismatic evidence may be able to cast more light on the reign of Sihtric, and his relationship with Æthelstan, how this affected the legitimacy of Sihtric's rule and how he chose to communicate this on his coins.

The coins of the early 920s in fact show relatively little difference from the Swordless St Peter coins of the 910s; the coins of Rægnald made very little lasting impact upon the coin design. The main type for the 920s was the anonymous Sword St Peter, differing from the Swordless by the addition of a sword in the centre of the reverse of the coin, which divides the dedication to the saint, who was the patron of York Minster. Although the coins of Rægnald grab the attention of the numismatist and coin collector due to their rarity and unusual designs, their stylistic impact upon the coin design in York may well have been negligible.

The Sword St Peter coins are part of a group of coin types that feature the sword motif, and have recently been studied by Blackburn, but are once again the subject of study since the discovery of twenty-six new specimens in the Vale of York hoard in 2007.¹⁵¹ There are also Sword types naming Sihtric as king, some are dedicated to St Martin and were produced in Lincoln, and there are some anonymous Sword types that do not have a religious dedication. A new type with the inscription RORIVR, which is believed to represent the name of the town it was minted, was also discovered in the Vale of York

¹⁵¹ B. Ager and G. Williams, 'The Vale of York Viking Hoard: Preliminary Catalogue', in *Studies in Early Medieval Coinage, Volume II*, ed. by T. Abramson (Woodbridge: Boydell, 2011), pp. 142-3.

hoard in 2007.¹⁵² The significance of the sword has been widely discussed and it is generally seen either as a Viking cultural symbol, or as a symbol of St Peter, to whom this coin is dedicated.¹⁵³ The Sword of Carlus as a Viking symbol seems a more convincing argument, as the sword is not St Peter's main attribute; this is his keys.¹⁵⁴ The Sword of Carlus served as Dublin royal regalia and insignia, became associated with the dynasty of Ivar from the later tenth century, and subsequently frequently appeared in medieval literature as a sign of kingship.¹⁵⁵ The use of the sword has been interpreted as meaning Sihtric was a direct descendant of Ivar, but genealogical descent may not have been important. It is the claim to this royal lineage that was the most important aspect of the use of this sword. Whether Sihtric was a descendant of Ivar or not, he was using the iconography on his coins to proclaim a legitimate lineage.



Figure 2.16 The St Peter and Sihtric Sword types: a-b) St Peter with mallet, obv: REVITII, rev: SCIE DIIO, c-d) St Peter with hammer, obv: TIRIVEIO, rev: SCIE TIIO, e-f) Sihtric, obv: TROEAITRAC, rev: SITR ICRE.¹⁵⁶ The Thor's hammer appears on the reverse of this St Peter coin, and a cross on the reverse of Sihtric's coin.

¹⁵² G. Williams, 'Coinage and Monetary Circulation in the Northern Danelaw in the 920s in the Light of the Vale of York Hoard', in *Studies in Early Medieval Coinage, Volume II*, ed. by T. Abramson (Woodbridge: Boydell, 2011), p. 149.

¹⁵³ A. De Bles, *How to Distinguish the Saints in Art: By their Costumes, Symbols and Attributes* (New York: Art Culture Publications, 1975), p. 157; Blackburn, 'Currency under the Vikings, Part 2', 209-17; Williams, 'Monetary Circulation in the Northern Danelaw', pp. 148-9.

¹⁵⁴ De Bles, *How to Distinguish the Saints*, p. 157.

¹⁵⁵ Downham, *Viking Kings of Britain and Ireland*, pp. 8, 119-20; Haigh, 'Danish Kings of Northumberland', 69.

¹⁵⁶ EMC coins: 1001_518; 1004_0627.

It is the symbols other than the sword on these coins which have been most discussed in recent years. The Sihtric and St Peter coins feature a plain cross on the reverse, and both types also generally contain a Thor's hammer on the obverse as part of the inscription. The cross usually contains pellets in each quarter, as in Figure 2.16e above. This use of pellets can also be seen in contemporary Carolingian coins.¹⁵⁷ The other Sword reverse types are two types of Thor's hammer: the T-hammer, as seen in figure 2.16b above, and the mallet, as seen in Figure 2.15a. There has been some discussion as to whether the T-hammer is in fact a mallet at all, as this shape is similar to a Christian Tau cross, and it is the same style of cross as used on Rægnald's coins.¹⁵⁸ Taken together, the two symbols, as well as the mallet, which appears on the obverse of many Sword coins in the lower inscription, would seem to perform the function of syncretism. In comparing the cross with the hammer, they could have functioned to draw attention to the similarities in use and meaning between the two symbols and between religions. Far from being symbols of paganism, the hammer and mallet are possible tools of conversion.

It is not only the use of the Thor's hammer, but also its use in conjunction with a cross or Christian dedication that is the most interesting aspect of the iconography of the Sword types. Does the issue of another anonymous coinage dedicated to St Peter mean that Sihtric had lost control of York, or was the Archbishop in control of the Mint?¹⁵⁹ It has been argued above that the Swordless St Peter anonymous coinage does not necessarily represent a diminution of royal power, but a close relationship with the ecclesiastic powers

¹⁵⁷ Blunt, Stewart and Lyon, *Coinage in Tenth-Century England*, p. 106.

¹⁵⁸ Rashleigh, 'Remarks on the Coins of Northumberland', 79; Haigh, 'Danish Kings of Northumberland', 63.

¹⁵⁹ Rollason, 'The Evidence of Historical Sources', pp. 313-14.

at York. The return to the Two Line inscription and religious dedication may not be a sign of the weakness of Sihtric, but of his power. The Swordless St Peter coins were no doubt still in circulation after the short reign of Rægnald, whose coins were experimental and of poor quality, weight and literacy. The St Peter design may have been the most trusted coinage in York and its kingdom, and Sihtric echoed this design in his coins, both the types in the name of St Peter and his own name, to maintain a buoyant economy for his kingdom. The addition of the Sword was, in effect, the stamp of regal power upon these religious coins. In the same way in which Rægnald had used the bow and arrow on his coins to assert his military prowess, Sihtric could have used the sword in conjunction with a familiar coin type to legitimise his kingship by reference to the ideological strength of his perceived efficacy in warfare.

The combined use of the cross and the mallet in the Sword coins, and the Thor's Hammer and cross placed on different reverses, indicates that the mallet and cross were not opposing symbols but complementary. The combination of two belief systems in one object or piece of sculpture was not unusual in the conversion process. The technique of conversion through syncretism had already been seen on Anglo-Saxon artefacts, mainly those produced in the eighth century when an earlier wave of conversion was taking place in England. The Franks Casket is an example of the use of Germanic and Christian imagery being used together on a sacred object. The front of the casket combines the adoration of the magi with the legend of Wayland the Smith, and it is thought these images

were carved with the intention of using the familiar Germanic tale to relate Christian ideas to viewers when the casket was made in eighth century Northumberland.¹⁶⁰

Other instances of the combination of pagan and Christian imagery can be found on Viking Age sculpture in the north; most notably the tenth-century Gosforth cross uses both pagan Norse and Christian symbolism.¹⁶¹ The east face of the cross shows a crucifixion scene, which is the only definite Christian scene on the cross, the others being ambiguous. The same face features a Ragnarok scene above the crucifixion in which a man with a spear battles against a monster. Both scenes show triumph over evil. Other tales that are related in Snorri Sturluson's thirteenth-century *Edda* appear on this cross: Loki is punished with dripping snake venom and Heimdallr holds his horn with which to rouse the gods, both of which are associated with Ragnarok. Other carvings that use comparison of pagan and Christian elements include the 'Fishing Stone', also from Gosforth, which documents Thor's fishing trip and perhaps draws a comparison to the Leviathan or the hart and a snake.¹⁶² Still more include stones at Ovingham and Kirkbymoorside, again showing Ragnarok,¹⁶³ as well as some ambiguous figures, which could be read in either a pagan or Christian context. The use of symbolism to draw comparisons rather than contrasts, and to convert through familiarity rather than by force, is also seen in an eighth-century

¹⁶⁰ L. Webster, 'The Iconographic Programme of the Franks Casket', in *Northumbria's Golden Age*, ed. by J. Hawkes and S. Mills (Stroud: Sutton, 1999), pp. 227-246.

¹⁶¹ R.N. Bailey, *Viking Age Sculpture in Northern England* (London: Collins, 1980), pp. 125-31; T.A. DuBois, *Nordic Religions in the Viking Age* (Philadelphia: University of Pennsylvania Press, 1999), p. 150.

¹⁶² Bailey, *Viking Age Sculpture*, pp. 131-2; Turville Petre, *Myth and Religion of the North*, p. 94.

¹⁶³ *Ibid.*, pp. 133-4.

document from Pope Gregory to Boniface, in which he urges the missionary to compare pagan superstition with Christian dogma.¹⁶⁴

The hammer and cross on the Sword coinages could therefore, have been used as symbols of religion, used together to emphasise the similarities between the gods and amuletic qualities of their symbols. Placed in context with Sihtric's marriage to Æthelstan's sister, the assertion of a pagan religion, even when it is compared favourably with Christianity, is important. Under previous rulers of York, the use of Christian symbolism is overt with no hint of any other religion. The decision to continue to use the Thor's hammer from Rægnald's coins is potentially an important one. It may well be a sign of a new confidence in the Viking kings to risk expressing their own culture and religion on their coins. The use of crosses and religious dedications still hints at a close relationship and the support of the Church at York, with the use of hammers both showing evidence of a pagan religion, but also being used as a tool of conversion. The additional use of the sword could have served to proclaim regnal authority and also a perceived or real inheritance from the dynasty of Ivar.

The variety in the Sword types is confusing, and it has been suggested that they were minted at different locations. This would represent a significant expansion of minting in the Viking kingdom of York, but also raises questions about which of the issues are official, and which, if any, are imitations of those official types. The Sihtric and St Peter Sword coins both have York mint signatures, and it has been argued from inscription and finds evidence that the St Peter coins were made at York and Sihtric's coins were minted

¹⁶⁴ Ibid., p. 130.

somewhere else within the Five Boroughs.¹⁶⁵ It has been argued that the implications of this are that Sihtric was king of the Viking Kingdom of York but did not hold York itself, although there is no reason to suggest that Sihtric could not have minted coins at several mints with different designs at each.¹⁶⁶ It is to be hoped that further work, in light of the twenty-six new coins from the Vale of York hoard, will clarify the mints of all the Sword types, and then a full analysis of the geography of Sihtric's kingdom can be undertaken.



Figure 2.17 The Sword St Martin type. Obv: LINCOLIA CIVT, rev: SCIM ARTI.¹⁶⁷ The St Martin type features an elaborate cross reminiscent of Manuscript carpet pages, and also an inverted T on the obverse as a muted Thor's hammer symbol beneath the legend.

The dedication on the Sword St Peter coins shows that there may have been a continuing role of the Church in the design and perhaps issue of these coins. The St Martin coins were minted in Lincoln and were dedicated to only a secondary saint of that city, perhaps because St Martin had some local significance.¹⁶⁸ The St Martin coins (Fig 2.17) feature an elaborate cross on the reverse, which echoes carpet page designs, and beneath the legend is an inverted T that is thought to represent the Thor's hammer on the Sihtric and St Peter coins.¹⁶⁹ The dating of St Martin coins has been seen as problematic as stylistically they were a product of the 920s, but according to the *Anglo-Saxon Chronicle*, Lincoln was

¹⁶⁵ Blackburn, 'Currency under the Vikings, Part 2', 212.

¹⁶⁶ Ibid., 215.

¹⁶⁷ EMC coin: 1016_0129.

¹⁶⁸ Blunt, Stewart and Lyon, *Coinage in Tenth-Century England*, pp. 106-7.

¹⁶⁹ Webster and Backhouse, *Making of England*, p. 80; Blunt, Stewart and Lyon, *Coinage in Tenth-Century England*, p. 106.

under Edward the Elder's control by this point.¹⁷⁰ However, the control implied in the ASC does not necessarily exclude the production of Viking coins in Lincoln, as Edward's role may have been less direct and more as an overlord..¹⁷¹

In addition to the St Peter, Sihtric and St Martin types there are two Anonymous Sword types, one with a two-line inscription divided by the sword and a sword circumscribed by the legend. The former Two Line type has recently been identified as a coin type of Sihtric.¹⁷² The latter Circumscription Sword type is considered an imitation of both the Ragnald Bow and Arrow/Hammer and Sword St Peter types, which were produced outside of York in the early 920s.¹⁷³ The progression from imitative coins in the 890s to a mature coinage, which itself is being copied, is remarkably swift, and it is surely the sign of an established currency when its coins are copied. A new Sword type, with the inscription RORIVACASTR,¹⁷⁴ was discovered in the Vale of York hoard in 2007.¹⁷⁵ It has been suggested on etymological grounds that Rorivacastr is the village of Rocester in Staffordshire near the Derbyshire border, which was the site of an old Roman fortress and was close to a major Roman road. If Rocester was the mint where these coins were made, this would have important implications for the Danelaw border in the 920s and would suggest Sihtric's lands, in which his coins were minted, stretched much farther south than

¹⁷⁰ ASC, A, s.a. 922 [918].

¹⁷¹ Blackburn, 'Currency under the Vikings, Part 2', 212; Downham, *Viking Kings of Britain and Ireland*, pp. 98-9.

¹⁷² G. Williams, 'The Conquest of the Northern Danelaw in the Light of the Vale of York Hoard and Related Coinage', in *Proceedings of the Sixteenth Viking Congress*, ed. by G. Ólafsson and S. Sigmundsson (forthcoming).

¹⁷³ Blackburn, 'Currency under the Vikings, Part 2', 211.

¹⁷⁴ Although Blackburn (pers. comm.) has expressed doubts as to this reading of the inscription, noting that the initial R looked very different to the central R in the top line of the inscription,

¹⁷⁵ Williams, 'Coinage and Monetary Circulation in the Northern Danelaw', p. 149.

previously thought.¹⁷⁶ It would also suggest that the iconography on all of the Sword type coins was remarkably unified throughout his kingdom.



Figure 2.18 The Anonymous and Rorivcastr Sword types: a) Anonymous, obv: EIIIERIIE, rev: EIDDVEARIX, b) Rorivcastr, obv: RORIVA CASTR, rev: OTARD MOT.¹⁷⁷ The Anonymous Circumscription Cross type is usually regarded as an imitation of the Viking Sword types, but the Rorivcastr type is considered a genuine Viking issue.

The evidence for Sihtric's reign, both documentary and numismatic is complicated, and begs more questions than it answers. However, in addition to the marriage treaty between Æthelstan and Sihtric, and the possible conversion of Sihtric concomitant to that treaty, the coins are probably the most interesting form of evidence for the early 920s. The use of a variety of new symbols, notably the sword and the Thor's mallet, as well as a T-hammer and some different types of crosses, raises interesting points about who was in control of York, and how they were using religion both as a tool of syncretism and as a statement of political maturity (Fig. 2.18).

¹⁷⁶ G. Williams, 'RORIVA CASTR: A New Danelaw Mint of the 920s', *Suomen Numismaattisen Yhdistyksen julkaisuja*, 6 (2009), 41-7.

¹⁷⁷ EMC coin: 1026_0039; G. Williams and B. Ager, *The Vale of York Hoard: British Museum Objects in Focus* (London: British Museum Press, 2010), p. 36.

Æthelstan and the Later Anglo-Saxon Kings of York

The untimely death of Sihtric opened the way for Æthelstan to gain control of York in 927, quickly wresting control from Sihtric's Viking successor, Guthfrith who had hurried to York from Dublin.¹⁷⁸ This event was momentous for the Viking Kingdom of York as after the conquest by the Anglo-Saxons, the city would never for long be free of invasions and interference from the Anglo-Saxon kings. This break with Viking rule can be seen both in the documentary sources and numismatically.

Æthelstan's rule in the north is recorded in the chronicles as scantily as the rest of tenth-century northern history, but although the capture of York was, in hindsight, a momentous occasion, at the time, Æthelstan was still struggling with his new northern kingdom.¹⁷⁹ Having gained York, the frontiers of his kingdom had changed. For example, Æthelstan raided Scotland in 933, attacking both by land and by sea.¹⁸⁰ The Scots appeared again at the Battle of Brunanburh siding with the Vikings against Æthelstan, but were defeated.¹⁸¹ Brunanburh was one of several battles recorded between the Vikings and their allies, and the Anglo-Saxons, in which the latter were victorious, and there were doubtless some battles in which the Vikings were victorious that were not recorded. This is hinted at by the entry in the *Anglo-Saxon Chronicle* for 942, in which Edmund recovers lands that, according to the same source, he was already in possession of.¹⁸² The loss of these lands was not recorded by the annalists. It is during Æthelstan's reign that a new form of evidence, so far as Northumbria is concerned, can be used to understand the Kingdom of

¹⁷⁸ ASC, E, F, s.a. 927. See Rollason, *Sources for York History*, p. 67 for discussion.

¹⁷⁹ Rollason, *Sources for York History*, pp. 67-8.

¹⁸⁰ ASC, D, F, s.a. 934.

¹⁸¹ ASC, A, E, F, s.a. 937.

¹⁸² ASC, A, B, C, D, s.a. 942.

York; there are several charters issued by the Anglo-Saxon king that give his title as *Rex totius Britanniae* ('King of All Britain').¹⁸³ One charter that is important for understanding Æthelstan's power at York is a grant of land in Cumbria called Amounderness to the Church in York.¹⁸⁴ The first law codes regarding coin production were also issued under Æthelstan at Grateley in c.928.¹⁸⁵ These laws provide valuable information about how he ran his minting, forbidding minting outside burhs and specifying punishments for breaking the laws; however, the Grateley code probably only referred to his mints within Wessex where his power was strong enough to enforce the penalties for transgression.¹⁸⁶



Figure 2.19 The main Anglo-Saxon coin type of the tenth century: Two-Line/Circumscription Cross of Edmund. Obv: EADMVND REX, rev: INGELGAR MO.¹⁸⁷ The moneyer Ingelgar is known to have produced coins for Olaf Sihtricson, Eric and possibly also Olaf Guthfrithson.¹⁸⁸

Æthelstan also instigated a new coinage regime in his new kingdom, linking the York coinage to the rest of his kingdoms both by design and by weight. Previously the York coins had been produced to a lighter weight standard that had been produced in Anglo-

¹⁸³ S. Keynes, 'England, c.900-1016', in *The New Cambridge Medieval History, c.900-c.1024, III*, ed. by T. Reuter (Cambridge: Cambridge University Press, 1999), p. 466.

¹⁸⁴ P.H. Sawyer, *Anglo-Saxon Charters: An Annotated List and Bibliography*, Royal Historical Society Guides and Handbooks, 8 (London: Royal Historical Society, 1968), number 407; see Rollason, *Sources for York History*, pp. 72-3 for discussion.

¹⁸⁵ II Æthelstan, as published in Kinsey, 'Anglo-Saxon Law', 13-16.

¹⁸⁶ Kinsey, 'Anglo-Saxon Law', 13.

¹⁸⁷ *EMC* coins: 1001_586 obv and rev.

¹⁸⁸ See *EMC* coins: 1002_0520 rev, 1002_0525 rev, and 1034_1266 rev.

Saxon England since the coinage reform of Alfred in the c.880.¹⁸⁹ Æthelstan raised the weight of his coins in his new kingdom so that York could be linked economically to the rest of his realm. In terms of iconography, the York coins now looked very similar to those from the rest of the country, and bore the Two-Line/Circumscription Cross design (Fig. 2.19). The York coins also now carried the name of the moneyer rather than the mint signature, in line with other Anglo-Saxon coins. This is useful in tracing the working lives of these moneyers throughout the changes in rule of the 940s and 950s, and a large number of them worked for both Anglo-Saxon and Viking governments. Æthelstan's successors at York, Edmund and Eadred, also issued coins at York of the basic Two-Line/Circumscription Cross design that was issued in the rest of their kingdom. The most striking feature in the design of Æthelstan's coins, and one which does not appear in the coins of his successors, is the inscription on one type that reads REX TO[tius] BRIT[anniae], which declared the Wessex king as ruler of all Britain (Fig. 2.20).



Figure 2.19 Æthelstan's Totius Britanniae type: EDIZTANT + TOTIUS BRITANNIAE.¹⁹⁰ Æthelstan used this coin type issued at York, to proclaim himself King of All England.

The other coins of Æthelstan and his successors do not reveal much about his rule of York. The non-standard coin types, like those of Edward before, were made in Mercia and contain some interesting symbols that perhaps say more about the former kingdom of Mercia than anything about the Kingdom of York. The Tower type of Æthelstan features

¹⁸⁹ Blackburn, 'Currency under the Vikings, Part 1', 33.

¹⁹⁰ EMC coin: 1006_193 obv.

a building standing on a line over the moneyer's name, and is similar, although not identical to the Tower and Minster types of Edward the Elder (Fig. 2.20a-c).¹⁹¹ These rather grand designs showed the Anglo-Saxon kings' power to build both monumental scaled buildings and also their ability to build defensive structures, such as forts and burhs, to keep the Vikings out of their kingdoms. Other favoured Mercian designs are the Flower and Floral types, perhaps referencing biblical vine scroll, the former featuring a flower on a line over the moneyer's name, and the latter showing a stemmed flower with the moneyer's name across the field and in the fronds.¹⁹² Both the Towers and Flowers/Floral reverse designs appear in conjunction with a Circumscription Cross obverse, and are seen as types of Edward, Æthelstan, Edmund and Eadred (Fig. 2.21d-e). Another typically Mercian feature is the use of a rosette of pellets rather than a small cross pattée as both the central feature in a Circumscription pattern, and the five additional symbols on Two Line designs. The Tower designs are not seen on later Viking coins, although Olaf Sihtricson does copy the Flower type on one of his coin types. The use of another cross variant, the Cross Moline, which is a cross with curved ends, can also be seen on the coins of Rægnald II and Olaf Sihtricson.¹⁹³

¹⁹¹ North, *English Hammered Coinage*, pl. 11, and numbers 684, 666 and 667.

¹⁹² *Ibid.*, pl. 11 and numbers 658, 659, 703.

¹⁹³ *Ibid.*, 8 and numbers 547, 542.



Figure 2.21 Tower and Flower types Anglo-Saxon reverse designs of the tenth century: a) Edward's Burh or Tower type, b) Edward's Minster type, c) Æthelstan's Tower type, d) Edward's Flowers type, e) Edward's Floral type.¹⁹⁴

The annals celebrate Æthelstan's victory at York, but it is the new legal documents, such as law codes and charters, that illuminate most about the ways in which the Anglo-Saxon kings exerted their power through administrative means as well as military. However, these documents are, like the annals and other forms of documentary evidence, scant in York. The law code from Grately was not enforced in York, and there is only one charter for York under Æthelstan's rule, in which he gave some land in Cumbria, called Amounderness to the church at York.¹⁹⁵ The coins of Æthelstan's new kingdom clearly show that York was not only part of his kingdom politically, but was also economically integrated with his other realms. Æthelstan had succeeded in capturing York, but both he and his successors had to work hard to keep their newly-acquired northern kingdom. Æthelstan proclaimed his achievements loudly on documents and coins, and he and his brothers Edmund and Eadred had to continue to work hard in terms of military campaigns to capture, maintain and recapture York from the new neighbours further north, and from Vikings attempting to reclaim their land. By enforcing his coin types in York, Æthelstan made his new kingdom's coins exchangeable with those of his other kingdoms. The rise

¹⁹⁴ EMC coins: 1002_0592 rev; 1009_0316 rev; 1002_0609 rev; 1020_0758 rev; 1009_0313 rev.

¹⁹⁵ Whitelock, *English Historical Documents*, pp. 505-6.

in weight standard made coins in York the same metal value as other Anglo-Saxon coins, but it was the use of familiar designs that marked the coins of York as an Anglo-Saxon product.

Olaf Guthfrithson

The death of Æthelstan in 939 provided an opportunity for a Viking leader once more to regain authority in York. This new ruler, who had earlier fought alongside Guthfrith against Æthelstan in the Battle of Brunanburh, did not get much discussion in the annals.¹⁹⁶ Olaf's father was the Guthfrith who had briefly ruled York after the death of Sihtric but was expelled swiftly by Æthelstan upon his invasion. Olaf appears to have taken advantage of the death of Æthelstan to move in and take control of York in much the same way that Æthelstan exploited the death of Sihtric, by arriving in the city very quickly. This tactic appeared to have worked for both Æthelstan and Olaf, as both kings held on to the kingdom of York until their deaths.¹⁹⁷

The coins of Olaf Guthfrithsson are some of the most interesting and recognisable of the Viking period; the Raven type is often used in modern scholarship as symbolic of the Vikings in England in discussions of their rule.¹⁹⁸ Olaf's other coin types include the more Anglo-Saxon style Circumscription Cross, Flower and Two Line types. The bird on these coins was a subject of discussion for antiquarians, who viewed the symbol as either a firm

¹⁹⁶ Rollason, *Sources for York History*, p. 68.

¹⁹⁷ Rollason, *Sources for York History*, pp. 67-8.

¹⁹⁸ Such as the front cover of Smyth's, *Scandinavian York and Dublin*, II, and on the back cover of *Aspects of Anglo-Scandinavian York*, by R. A. Hall *et al.* (York: Council for British Archaeology, 2004).

assertion of Viking religion on coins, or a precursor to the dove on the Agnus Dei type of Æthelred II, some decades later.¹⁹⁹ The bird on these coins has been typically identified as a raven and recognised as an attribute of Odin, who had two raven familiars named Hugin and Munin.²⁰⁰ This direct identification with Norse mythology would seem fairly sound but, given the heavy Christian symbolism on all previous Viking coins of York, the symbol could also have had some Christian meaning. This could mean that the bird is not a raven, or that the raven has some Christian significance. There may also have been some understanding of the bird in a Christian context, perhaps as one of the attributes of the Northumbrian saint Oswald who had a widespread following in Northumbria after his death, and in a twelfth-century description of his death, a raven descended upon his body on the battlefield and took his arm, which once dropped from an ash tree, formed a spring.²⁰¹ The bird itself has been argued to be a bird of prey due to its hooked beak and talons, and it could be that the bird is in fact an eagle, a symbol of the Christian faith and St John, rather than a pagan raven.²⁰² Birds are commonly found on earlier Anglo-Saxon sceattas in a Christian context and appear again on Edward the Confessor's coinage.²⁰³ Yet the appearance of cultural and religious symbols of Norse paganism on the earlier Bow and Arrow/Hammer coins of Rægnald, and on the Sword types, would suggest that a pagan raven motif would not be out of place and that there was some understanding of the bird in its Norse context as the familiar of Odin. The use of the raven would, therefore, suggest not only a rejection of Christianity as a tool of legitimisation of

¹⁹⁹ Haigh, 'The Danish Kings of Northumberland', 71.

²⁰⁰ Oman, 'Danish Kingdom of York', 16n.

²⁰¹ Rollason, *Northumbria*, pp. 198-9.

²⁰² Haigh, 'Danish Kings of Northumberland', 71.

²⁰³ Gannon, *Iconography of Anglo-Saxon Coinage*, p. 107.

Olaf's rule, but also a claim that he was in some way descended from Odin, or that he enjoyed the god's special protection.



Figure 2.22 Olaf Guthfrithson's coins: a) Raven type, obverse, b) Circumscription Cross type, obverse. Both coins read ANLAF CVNVNC.²⁰⁴ These coins are one of only two coin series ever to feature a language other than Latin in the inscription (the other being the coins of the Commonwealth, 1649-60). The use of Old Norse on these coins and other Viking coins of the 940s was a powerful statement both of ethnic origin and cultural pride for Olaf Guthfrithson, and as such a rejection of the Anglo-Saxon language of kingship.

This raven symbol is combined with an Old Norse inscription which reads ANLAF CVNVNC, and hints at a deliberate emphasis on Viking authority (Fig. 2.22). This inscription is also found on some of Olaf's other coins, and on the coins of Olaf Sihtricson, Rægnald II and Sihtric II. The use of Old Norse in the inscription was a choice on the part of Olaf or a close adviser as there is no precedent for the use of Old Norse on coins before this. The use of a language other than Latin hints at innovation within the known boundaries of coin design, and the confidence in the rule at York to disregard the official tenth-century language of authority. In using Old Norse, Olaf rejected the idea of Latin as the official language of rulership, and used a language of his own lineage, combined with the raven symbol of one of his gods, to proclaim his legitimacy outside the Anglo-Saxon and Carolingian models of kingship.

²⁰⁴ EMC coins:1004_628obv; 1034_1245 obv.

The combination of bird and Old Norse inscription indicates a pagan meaning for the bird. The Raven type follows the precedent set by the Sword coinages of the 920s, which combined pagan mythology of a Thor's hammer, with the Christian attributes of crosses and a religious dedication. The difference with Olaf Guthfrithson's coinage is in the balance between the two religions. On his coins the raven is featured on the obverse of the coin, surrounded by an inscription in Old Norse proclaiming his kingship. The small cross pattée is relegated to the reverse. Although these coins appear with a bold new design, they still conform to the Anglo-Saxon coin types introduced by Æthelstan. The Raven coins are the same as tenth-century Anglo-Saxon portrait types, with the raven replacing the portrait, which is a bold substitution of a portrait from a Roman inheritance with a stark symbol of Norse paganism. The coins of Olaf Guthfrithson show conformity with the Anglo-Saxon coin weight and design standards, the Viking love of creative and innovative designs, as well as a confidence in producing and issuing money. The coins of Olaf Guthfrithson add to our understanding of the means by which the Viking kings ruled in York. They add a subtle layer of detail to the historical texts and add to our understanding of not just who was ruling York after Æthelstan's death, but also how he ruled. By using cultural and religious elements from Scandinavia, and disdaining to use overt symbols of Christianity and Latin, Olaf rejected the tools of legitimisation that his forbears had used. In using a Norse pagan symbol and Old Norse in his inscriptions, Olaf emphasised his Scandinavian royal and even mythological descent. Yet for all this radical imagery, he continued to use Anglo-Saxon coin types as a basis for his designs, realising that whilst individual symbols could be radically different from before, there had to be a

continuation in coin design to make sure that his coins were trusted and accepted as the legitimate currency of a legitimate king.

Olaf Sihtricson, Rægnald II and Sihtric II

The annexation of York by Æthelstan had changed the political scene in York, and even after Æthelstan's death it proved difficult for any one ruler, Anglo-Saxon or Viking, to maintain a permanent power base at York. By the 940s, the Vikings were not rulers of a secure independent kingdom but at the mercy of their neighbours, the West Saxons. The documentary sources give an impression of chaos in the rule of York, with both Viking and Anglo-Saxon rulers repeatedly struggling for power. There are some references to the sponsorship of conversions of two Viking kings Olaf Sihtricson and Rægnald II in 943.²⁰⁵ Comparisons here could be drawn with the conversion of Guthrum in that the conversion occurred when the Vikings had lost a battle, and he was given land to rule. Only in this case, the baptism probably functioned as a ceremony of overlordship, as well as a religious ritual, unlike Guthrum's rule of East Anglia, which does not appear to have come with any such constraints. This may explain why the conversion didn't last very long. Sources agree that Rægnald was baptised in the same year as Olaf, but after some interval.²⁰⁶ This delay could be because Olaf had already been driven out of York,²⁰⁷ although the sources indicate that Rægnald and Olaf fled at the same time.²⁰⁸ Or it may have been because Rægnald was a lesser ruler under Olaf, or only agreed to the baptism at a later stage. The idea of dual rule as a trait of Viking kingship is again raised with these kings, as it was

²⁰⁵ *ASC*, A, D, s.a. 942; *ASC* D 943.

²⁰⁶ *ASC*, D, s.a. 943.

²⁰⁷ *HR I*, 943; *ASC*, A, E, s.a. 944.

²⁰⁸ *ASC*, A, E, s.a. 944.

with the reigns of Cnut and Siefred in the 890s. To complicate matters further, another king named Sihtric II issued coins at York but is not mentioned in the texts.

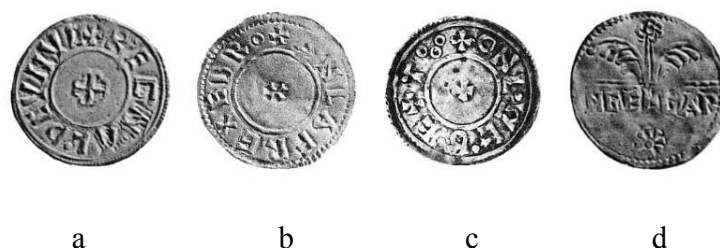


Figure 2.23 Anglo-Saxon style coins of the Viking kings of the 940s: a) Cross Moline coin of Rægnald II, REGNALD CVNVN, b) Circumscription Cross coin of Olaf Sihtricson, ANLAF REX EBRO, c) Circumscription Cross coin of Olaf Sihtricson, ONLAF REX T, d) Floral type coin of Olaf Sihtricson, naming the moneyer (I)NGELGAR.²⁰⁹ These coins were made after the Anglo-Saxons had annexed York and imposed upon the coins of that city their own weight standard and standardised designs. Rægnald II, Sihtric II and Olaf Sihtricson continued to issue coins with these designs, but also issued coins with radically different symbolism, such as the Triquetra/Standard coins discussed below.

In terms of their coins, those of Olaf Sihtricsson, Sihtric II and Rægnald II share various obverse and reverse types which contain very interesting iconography (Fig. 2.23). They also all each copy one or more of contemporary Anglo-Saxon coin types of Edmund or Eadred. Table 2.1 below shows how much the three Viking kings had in common in their coin types, and also between their types and those of the Anglo-Saxon kings. Olaf Sihtricson in particular, seems to have produced more Anglo-Saxon designs in his coins. The Cross Moline does not appear on contemporary Anglo-Saxon coins, and represents the use of an Anglo-Saxon coin type but with original features added to the design. The implication being that someone with knowledge of Christian iconography advised the Viking kings on coin design, and that ecclesiastical support of the Vikings was

²⁰⁹ EMC coins: 1002_0523 obv; 1006_0074 obv; 1004_0642 obv; 1002_0520 rev.

demonstrated through the coins. There are records in contemporary texts of the activities of the Archbishop of York, Wulfstan, during the 950s, which seem to show he was involved in repudiating the rule of both Anglo-Saxon kings and installing Viking kings in York, and that he was arrested by Eadred for these activities.²¹⁰ The Anglo-Saxon coin types of Olaf Sihtricson, Rægnald II and Sihtric II show that the Anglo-Saxon influence in York was strong, and these kings were not in office long enough to instigate any major change in all of the coin types. However, the fact that they issued coins in their names at all, when some of their reigns were very short, shows that they valued the role of the coins in promoting their reigns and that coins were issued in their names as a priority at the start of their reigns.

Table 2.1 Coin types of the 940s. The substantive coin types are in bold; all other types are Northern regional variants.

Coin type	Olaf Sihtricson	Rægnald II	Sihtric II	Edmund	Eadred	Eric
Triquetra/Standard	x	x	x			
Circumscription Cross	x		x	x		
Bust Crowned				x	x	
Circumscription Rosette					x	
Cross Moline	x	x				
Flower	x					
Floral					x	
Two	x			x	x	x
Line/Circumscription						
Cross						
Two				x	x	
Line/Circumscription						
Rosette						

The most interesting feature on these coinages, from a religious point of view, is the use of the triquetra and standard symbol. The triquetra is a three-lobed interlocking symbol and can be seen in the coins of Figure 2.25 below; the standard is a triangular-shaped fringed

²¹⁰ ASC, D, s.a. 952, 954; Rollason, *Sources for York History*, p. 70.

flag hung on a pole, which is topped by a trefoil of small pellets. The Triquetra/Standard type coins look very different from other Anglo-Saxon and Viking coins of the 940s, but had in fact, merely replaced the central cross or rosette with a very different image. This technique recalls the Bow and Arrow/Hammer coins of Rægnald I, in which the central crosses were replaced by interesting symbols of Viking culture and religion. The standard inevitably brings to mind the passage in the *Anglo-Saxon Chronicle* when Ivar and Halfdan landed in Wessex under the Raven standard, and indeed later Viking kings, such as Cnut, are said to have carried a Raven standard into battle.²¹¹ Standards have been found on the sceatta coins although these tend to be of a Roman-type design, being square and featuring crosses, rather than the pennant design on Viking coins.²¹² The use of a battle emblem does echo the use of the Bow and Arrow on coins of Rægnald I and the Swords which were used some twenty years earlier. An alternative explanation for the standard is that it was really a Scandinavian weather vane. These distinctive triangular metal objects have also been interpreted as depictions of a personal banner or standard.²¹³ However there is no evidence that weather vane standards were produced in England, and given that the vanes themselves are probably representations of war standards, it would appear the standard is a correct attribution.

²¹¹ *ASC, E*, s.a.878; A. Campbell and S. Keynes (ed.), *Encomium Emmae Reginae*, Camden Classic Reprints, 4 (Cambridge: Cambridge University Press for the Royal Historical Society, 1998), pp. 24-5.

²¹² See North, *English Hammered Coinage*, pl. 1, numbers 16-26 for examples, and Gannon, *Iconography of Early Anglo-Saxon Coinage*, pp. 171-2 for discussion of the imagery.

²¹³ S. Lindgrén and J. Neumann, J. 'Viking Weather-Vane Practices in Medieval France', *Fornvännen*, 78 (1984), pp. 197; J. Graham-Campbell, *The Viking World* (New Haven: Ticknor & Fields, 1980), p. 149; A. Bugge, 'The Golden Vanes of Viking Ships', *Acta Archaeologica*, 2 (1931), 159-84.



Figure 2.24 The standard symbol on coins: a) Olaf Sihtricson, FARMAN MONETA, b) Olaf Sihtricson, ASCOLV MONETA, c) Sihtric II, FARMAN MONE, d) Sihtric II, ASCOLV MONETA, e) Rægnald II, BA[CIAGER] MONETA.²¹⁴ The standard always appears as the reverse design to the Triquetra on Viking coins, shown in Figure 2.24 below. The standard is another symbol that is unique to Viking coins, and in conjunction with the triquetra, makes these coins extremely interesting iconographically. This coin type was issued by three different kings, and each is almost identical save for the king's name on the obverse. Two moneyers, Æscwulf and Farmann, worked on both Sihtric II and Olaf's coinages.

The obverse of this type featured a triquetra, which has also typically been taken to be a Norse symbol, especially with its juxtaposition with the banner on the reverse of this coin type, and parallels have been drawn with elements of Scandinavian sculpture and metalwork of the Borre and Jellinge styles.²¹⁵ Yet there is also a precedent for the use of the triquetra in Christian Anglo-Saxon art, notably on the sceattas of the sixth to eighth centuries, and on some Northumbrian stycas (Fig. 2.25).²¹⁶ The device is also found as decorative elements on inscribed bone, metalwork and decorative manuscripts.²¹⁷ The triquetra in Christian art may have functioned as a symbol of the Holy Trinity and is also found in complex manuscript illuminations, metalwork and stone and bone carvings of the

²¹⁴ EMC coins: 1002_522 rev; 1034_1253 rev; 1004_0644 rev.

²¹⁵ For example, a trefoil brooch in the Borre style: *British Museum*, MME 1873,12-11,1.

²¹⁶ E.J. Pirie, 'Contrasts and continuity within the coinage of Northumbria c.670-876', in *Coinage and History in the North Sea World, c. AD 500-1200: Essays in Honour of Marion Archibald*, ed. by B.C. Cook and G. Williams (Leiden: Brill, 2006?), p. 226; Haigh, 'Danish Kings of Northumberland', 71.

²¹⁷ Webster and Backhouse, *The Making of England*, pp. 112, 274 for examples.

period.²¹⁸ However, it is more likely that the triquetra was more of a building-block of complex interlaced designs than used as a symbol in its own right, as can be seen on trial bone carvings from the period.²¹⁹ Thus, the triquetra could have been an example of Norse symbolism upon Viking coins, once again rejecting overt Christian symbolism as a tool of legitimisation in favour of promoting a Norse lineage to proclaim their right to rule.



Figure 2.24 Triquetras on coins: a) York Sceatta of King Eadberht (737-758), featuring a triquetra below a quadruped, b) Olaf Sihtricson, ANLAF CVNVNC, c) Sihtric II, SITRIC CVNVNC, d) Rægnald II, RE[GNALD] CVNVNC.²²⁰ The triquetra was a common symbol on Anglo-Saxon art and featured reasonably frequently upon early Anglo-Saxon sceattas, but the Vikings were the first, and only, people to use this symbol on later pennies.

The coins of Olaf Sihtricson, Rægnald II and Sihtric II have been used in conjunction with the documentary sources to refine the chronology of the 940s. Unfortunately, neither type of evidence provides a clear answer to the problem of chronology, and various scholars have argued for varying dates and reigns of these and the Anglo-Saxon kings at York. But can the coins convey anything more than temporal information? I would argue that the symbolism on these coins can provide an insight into York in the 940s. It was a time of upheaval and many kings with many short reigns. New Viking kings issued coins in their

²¹⁸ Gannon, *Iconography of Anglo-Saxon Coinage*, p. 162.

²¹⁹ For example, see the decorative animal bone that contains an experimental carving of a triquetra: *British Museum*, MME 1940, 2-2.1.

²²⁰ Classical Numismatics Group, *Triton XII Sale*, 6-7 January 2009; *EMC* coins: 1034_1249 rev; 1034_1253 rev; 1004_0644 rev.

own name as a matter of urgency, and issued one or two types at a time, usually an Anglo-Saxon type and the Viking Triquetra/Standard type. The Anglo-Saxon types used were copies of the Anglo-Saxon coins that were common in York, although to the modern numismatist, they are the rarer northern types of Edmund and Eadred. The Triquetra/Standard type echoed the Bow and Arrow/Hammer type of Rægnald I, with the circumscription design and the use of a military motif as well as a religious one. The use of a new form of cross, the Moline on the Anglo-Saxon types issued by Olaf Sihtricson and Rægnald II, as well as the use of the triquetra on the Viking types, hint at a close relationship with the Church at York. This relationship is hinted at by the arrest of Wulfstan in 952 by Eadred, as well as the records of the Northumbrian counsellors choosing Viking kings over Anglo-Saxon ones. Christian imagery is present on all the coins of Viking York, and it is in the variations of designs and subtle understanding of Christian symbolism that the cooperation with the Church provided can be seen throughout.

Eric Bloodaxe

The last king of Viking York was Eric, and there has recently been much discussion about who he was and where he ruled. According to historical and numismatic convention, which will be used here, he is thought to have been Eric Bloodaxe, the son of Harald of Norway, who was invited to rule York in 947 and was expelled in 948 by Eadred.²²¹ His whereabouts are then unknown until he was once again invited to rule in York in 952.²²²

²²¹ *ASC, D*, s.a. 948.

²²² S. Keynes, 'Rulers of the English, c.450-1066', p. 505; Blackburn, 'The Coinage of Scandinavian York', pp. 337; *ASC, E*, s.a. 952.

Once again he was expelled from York, either by the Northumbrians, or by the treachery of Earl Maccus, and was killed on his flight from York on Stainmore in the Pennines.²²³ This chronology is accepted by numismatists and many historians, with only minor differences in the dating.²²⁴

Recent work, however, has cast doubt on the assumptions that Eric is the son of Harald, that he ruled twice, and on the dates that he ruled. The doubt that Eric was part of the Norwegian royal family is expressed by Downham, as part of her theory that every single Viking king of York was part of the same Dynasty of Ivar.²²⁵ Downham argues that an earlier appearance of Eric in the *Life of St Catroe* means that King Eric of York and Eric Bloodaxe cannot be the same person, and the attribution is a confusion or conflation of the evidence in the later saga sources, even though the *Anglo-Saxon Chronicle* clearly states that Eric was the son of Harald.²²⁶ The same evidence from the *Life of St Catroe* has been used in other questions regarding Eric's lineage and reigns.²²⁷ Woolf, in his rebuttal to Sawyer's argument that Eric only ruled once, argues that the early appearance of Eric in the *Life of St Catroe* means that his first reign was in the late 930s as a sub-king of Æthelstan. Sawyer's chronology is based on the charter evidence and the early dating of Eric's death in the *Historia Regum*.²²⁸ These arguments of chronology are interesting and show how Eric legitimised his power through both conversion to Christianity in the *Life of*

²²³ *ASC, D, E*, s.a. 954; *HR I*, s.a. 952; the detail about treachery is found in *FH*, p. 503.

²²⁴ F. Stenton, *Anglo-Saxon England*, 3rd edn (Oxford: Oxford University Press, 1971), pp. 345-61; Rollason, *Sources*, pp. 67-9; S. Keynes, 'England, c.900-1016', pp. 472-3; Blunt, Stewart and Lyon, *Coinage in Tenth-Century England*, p. 212.

²²⁵ C. Downham, 'Eric Bloodaxe - Axed? The Mystery of the Last Viking King of York', *Mediaeval Scandinavia*, 1 (2004), 51-77; Downham, *Viking Kings of Britain and Ireland*, pp. 115-120.

²²⁶ Downham, *Viking Kings of Britain and Ireland*, pp. 118; *ASC, E*, s.a. 952.

²²⁷ Woolf, 'Erik Bloodaxe Revisited', pp. 189-93.

²²⁸ Sawyer, 'Last Scandinavian Kings of York', pp. 39-43.

St Catroe, and through the patronage of Æthelstan. The discussion of the documentary sources concerning Eric is likely to continue, but all the participants are united in their call upon numismatists to re-examine the coins of Eric to settle the debate.²²⁹



Figure 2.26 The coins of Eric: a) Circumscription Cross type, obverse: ERIC REX b) Sword type, obverse: ERIC REX.²³⁰

The coinage of Eric at first follows the pattern established by other Viking kings of the 940s in using the Anglo-Saxon weight standard and designs. Eric's coins from his first reign are therefore unremarkable in using the Circumscription Cross design and reverting to the Latin REX upon the inscription rather than the CVNVNC favoured by his recent forbears (Fig 2.26a). The Anglo-Saxon style of Eric's coins, and the Anglo-Saxon style coins of his Viking predecessors is unsurprising since many of them were made by moneyers who also produced coins for the Anglo-Saxon kings.²³¹ Several men, such as Ingelgar, Badric, Rathulf, and Farman signed their names on the coins of both Viking and Anglo-Saxon kings, and others such as Walter, Ulfelmm and Rernart minted exclusively for the Viking kings.²³² However, there are far more coins known from the moneyers who stayed in their post as moneyer throughout the 940s and 50s than of those who minted

²²⁹ Woolf, 'Erik Bloodaxe Revisited', 192; Sawyer, 'The Last Scandinavian Kings of York', 43; Downham, *Viking Kings of Britain and Ireland*, 119-20.

²³⁰ EMC coins: 1030_0269 obv; 1034_1277 obv.

²³¹ Blunt, Stewart and Lyon, *Coinage in Tenth-Century England*, p. 220.

²³² Ibid., p. 220.

exclusively for the Vikings. It seems that the office of moneyer was one where the skill of engraving and striking coins, or employing staff to do so was valued more highly than former political affiliations. The kings needed moneyers and were willing to accept skilled men who had not always supported them, and the moneyers were willing to bend to the latest political wind to continue in their profession.

His second coinage is a different story; these coins feature the sword of the coinages from the 920s (Fig. 2.26b). The presence of this sword has been said to argue many things: that he was a member of the Dynasty of Ivar reusing his clan badge, or that after his return from expulsion he was using iconography to reignite the spirit of an independent Viking kingdom of York.²³³ However, it has been argued above that the Sword of Carlus as the attribution for the swords on Viking coins is not now generally accepted, and the sword is seen more as a cultural symbol of the Viking kings than a badge of lineage.²³⁴ Coin designs were used, imitated and reused for many reasons in the tenth century, with legitimacy of the coinage and trust in its value being the primary features. It appears that having produced an Anglo-Saxon type coinage during his first reign, but having been harried out of York by an Anglo-Saxon king once, he made no concession to appeasing them in his second reign. Instead he re-used potent imagery from the Sword coinages of decades before, from a time before York had been incorporated into Æthelstan's kingdom. The use of the sword on Eric's coins was perhaps a political badge of independence from the Anglo-Saxon kings, which unfortunately did not work, as despite his best efforts Eric was once again expelled from York and killed during his flight.

²³³ Downham, *Viking Kings of Britain and Ireland*, pp. 119-20; Dolley, 'Post-Brunanburh Coinage', 79

²³⁴ See above, p. 49.

Conclusion

This iconographical study of the coins of Viking York has undertaken to examine how the Viking kings who issued these coins chose to present themselves to the audience of their own people and to anyone else who came into possession of their coins. The issue of how many people might have seen the messages stamped into their silver coins will be addressed in Chapter 3, but an analysis of what those messages may have been, and how the Viking kings wished to project themselves has been at question here. At the start of this chapter it was argued that early medieval kings, such as the Anglo-Saxon and Carolingian rulers, used their adherence to Christianity, their military strength and their royal lineage as tools to assert their right to rule. It was asked whether the Viking kings used those same tools to maintain their power in York, or whether they used different methods from their Scandinavian heritage to assert their power.

It is clear from the evidence of the coins that the Vikings in York used the symbolism of Christianity widely in their coins. This overt symbolism may have functioned to declare the religion of the king and his people, to build relationships with the churchmen in York and to assert the right of the Vikings to rule a kingdom in England. From the documentary sources, it is clear that their contemporaries in England and Ireland still regarded the Vikings as heathens and barbarians, but this does not mean their exercise in religious promotion was a failure. Another function of the crosses and Latin on the Viking coins was to show that the coinage itself was legitimate and could be trusted and used, in addition to bearing witness to the religious legitimacy of the kings who issued them and

the support of the Church that those kings enjoyed. It is immaterial whether Sihtric or Olaf Sihtricson and Rægnald II were actually Christian converts; the fact that it was on their coins was enough.

The use of Norse pagan symbolism has drawn much comment about the pagan nature of Viking coins, but no coin exhibits a symbol of Thor or Odin without an accompanying reference to the Christian God. The Vikings used pagan imagery in conjunction with the religion they knew was the officially-sanctioned creed of civilised Europe. The coins with ravens and hammers worked as both a tool of conversion for the Vikings in York, and also as a badge of their distinctive heritage, and even divine lineage. The use of Old Norse on the inscriptions of some Viking coins emphasised this independent lineage from the Anglo-Saxon kings. The use of more pagan and fewer accompanying Christian symbols in the 940s showed a move towards a new focus for the legitimisation of kingship. Olaf Guthfrithson and his successors were willing to use Norse symbols to show their Scandinavian lineage and descent from gods and warriors, rather than using their coins to demonstrate their legitimate right to rule by the adherence to and support of the Christian Church.

The military exploits of the Viking Great Army and the kings of York are well-known, and were also famous in their day. The contemporary sources painted these foreign invaders as a uniquely cruel and barbaric race of people, yet cheered when the equally bloodthirsty Anglo-Saxon kings defeated the Vikings in battle. Where the Vikings are unique is in their use of warlike symbolism on their coins. The Anglo-Saxon kings surely used bows

and arrows and swords in their armies, and perhaps went into battle led by a banner, but the Vikings were the ones who chose to proclaim their military prowess on their coins. Coins had formerly been the domain of purely Christian imagery, occasionally with a portrait that showed the king as a Roman emperor to assert his civilised legacy. The Vikings in the coins chose to mix the religious with the secular, and show that they were both militarily powerful and supported by the gods.

The coins of the Viking kingdom of York can be used with great effect to understand and refine the chronology of that kingdom, but they can also reveal much more than regnal dates. The imagery upon these coins gives an insight into the motives of the Viking kings, and an understanding of how they were using both Scandinavian and English imagery to create new designs that told whoever saw their coins who was king and why he had the right to rule.

Chapter 3

What Was the Volume of the Currency in the Viking Kingdom of York?

In the previous chapter, it was argued that the coins of Viking York transmitted messages that legitimised Viking rule, by using religious imagery, and by promoting military prowess and lineage through the designs on those coins. The next question to ask is how large was the potential audience of the messages on these coins, in other words, to estimate what the volume of the coinage was. Given all the thought and physical work that went into designing and making these coins, were enough actually produced that significant numbers of people would have seen them, and more importantly, how did the numbers of coins affect the economy in York?

This chapter will look at the numbers of Viking coins made, in the Viking kingdom of York. This is done using the numismatic methodology of the die estimate, which will be explained using the Swordless St Peter coinage as an example, and will show how die estimates can be used to understand volumes of coinages in the past. The volume of coinage will be estimated as a number of dies that were used in the production of a particular coinage; it would be more satisfactory to be able to estimate the numbers of coins produced, but as this chapter will show, this is a calculation that cannot be done with any degree of accuracy. To understand what the die estimate means about the volume

Viking currency, the results will be compared with later Anglo-Saxon and pre- and post-conquest English data to see how the die estimate for the coins of the Viking kingdom of York compares with those for other contemporary and later kingdoms. This comparative study will use the various medieval and Viking coin types to answer three questions: what was the volume of currency in Viking York, how similar or different was this to the volume of Anglo-Saxon and English currency, and did the Vikings produce enough dies to make coins in sufficient quantity to form a usable currency? These questions relate to the central themes of this thesis in understanding how the Viking kings of York ruled their kingdom, in this case, how far they achieved this by issuing coinage, and thus to assess how far complex numismatic techniques and theories can be used to address historical problems.

The Theory of Die Estimation

To begin to understand how to estimate the volume of a currency or coinage, it is necessary to understand how medieval coins were produced, as the basic production methods of coins form the basic elements of the evidence. It is worth noting that there was no great technological shift in how coins were produced from the eighth century, when the first broad pennies were made by Offa, to the sixteenth century and the introduction of machinery in the 1560s under Elizabeth I.¹ In medieval Europe, most coins were made by hand by placing a blank piece of metal (usually silver) between two dies and then striking the upper die with a hammer as shown schematically in Figure 3.1 below. Dies, made

¹ C.S.S. Lyon, 'Anglo-Saxon Numismatics', *British Numismatic Journal*, 73 (2003), 61; J. Craig, *The Mint: A History of the London Mint from A.D. 287 to 1948* (Cambridge: Cambridge University Press, 1953), p. 117; D.R. Cooper, *The Art and Craft of Coinmaking: A History of Minting Technology* (London: Spink & Sons, 1988), p. 46.

from iron or an iron alloy, were engraved using punches and a hammer to impress upon the surface of the die a design and lettering in mirror-image. The die face was then hardened using heat. The lower die (obverse) was usually secured in a work station, typically a wooden knee-height base, and the upper die (reverse) was held in the hand and received the brunt of the blows from the hammer. This process is seen in Figure 3.2 below, as the man on the left holds a hammer ready to strike the upper die held in place by his other hand. The reverse (upper) die wore out more quickly than the obverse die as a result of receiving the greatest force of the blows that could damage the die face, and also led to the die shaft shortening over time. The force of the blow impressed the image from each die face on to the coin blank and created a coin. This was not an especially technical skill, but a manual one involving strength and some accuracy.² The skill of the operation was in engraving the die face, preparing coin blanks to the right size, and administering the mint and its work.

² P. Grierson, *Numismatics*, Numismatics (Oxford: Oxford University Press, 1975), p. 108.

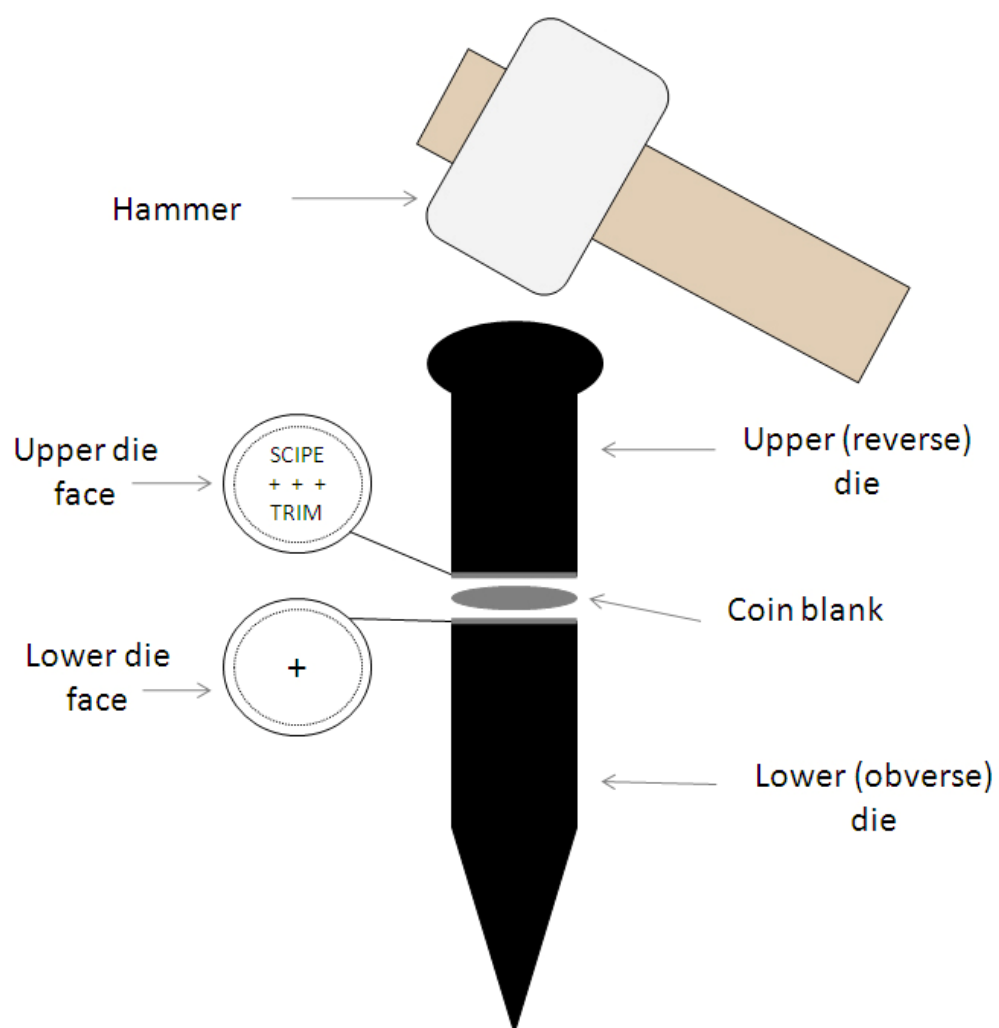


Figure 3.1 Schematic illustration of how a coin is made using a hammer. The die faces are engraved with the design and a coin blank is placed between them. The dies are then held together whilst struck with a heavy hammer. The lower (obverse) die has a spike so it can be secured into a work station, which was normally a wooden block, before coins were struck.



Figure 3.2 Medieval woodcut illustrating a mint worker striking coins using a hammer.³ Note that the man on the right of the picture uses a lower (obverse) die secured in a sturdy log to form his work station whilst he secures the upper (reverse) die in place with his left hand as he strikes it with a hammer.

This basic understanding of coin manufacture is used to estimate how many dies were produced to make any coinage. The calculations involved are complex, but an understanding of the statistical significance of the die estimates is important, so that the conclusions drawn from the data can be properly evaluated. Both the principles that lie behind the statistics and the calculations themselves will be examined in this chapter. There has been wide discussion on the methods and calculations used to estimate the volume of any coinage, with some arguing that the exercise is a futile one as there are so many historical and technical assumptions involved in the calculations that they are

³ From a woodcut depicting the mint at Hall-in-Tirol, Austria, by Hans Burkmaier the Older and Leonhard Beck, c.1515 AD taken from Lord Stewartby, *English Coins, 1180-1551* (London: Spink & Son, 2009), back cover plate.

meaningless.⁴ The current consensus is that estimating the number of coins produced in a type is not possible, but the number of dies used to strike those coins can be estimated without too much statistical error.⁵ Here, three different methods based upon different theoretical assumptions will be used in an attempt to minimise the inherent biases in each method, rather than relying on one method with its associated theoretical biases. The numbers of dies used for several coinages will be estimated using the same three methods and will then be compared; the consistency of the methodologies used will enable comparisons.

The early medieval period, and especially Anglo-Saxon coinages, have been studied intensively, and there is much work that has been done on this subject already,⁶ although not all of this work has resulted in full publication of the details needed for die estimate calculations and, as a variety of methodologies have been used, it is difficult to compare the results.⁷ For the tenth century, on which there has been intensive research, the best data available for die studies that are openly available is from the latter half of the century. For this chapter, the numerical die data have been taken from my own work on

⁴ T.V. Buttrey, 'Calculating Ancient Coin Production: Facts and Fantasies', *Numismatic Chronicle*, 153 (1993), 335-51; Buttrey, T.V. with D. Cooper, 'Calculating Ancient Coin Production II: Why it Cannot be Done', *Numismatic Chronicle*, 154 (1994), 341-52.

⁵ De Callatay, 'Calculating Ancient Coin Production: Seeing a Balance', *Numismatic Chronicle*, 155 (1995), 289-311.

⁶ Key articles on the discussion of the size of the Anglo-Saxon coinages are D.M. Metcalf, 'How Large Was the Anglo-Saxon Currency?', *The Economic History Review*, 18:3 (1965), 475-82 and P. Grierson, 'The Volume of Anglo-Saxon Coinage', in *Dark Age Numismatics: Selected Studies*, by P. Grierson (London: Variorum Reprints, 1979), pp. 153-60. Recently these themes have again been discussed in Lyon, 'Anglo-Saxon Numismatics', 58-75, M. Allen, 'The Volume of the English Currency, c.973-1158' in *Coinage and History in the North Sea World, c. AD 500-1200: Essays in Honour of Marion Archibald*, ed. by B.C. Cook and G. Williams (Leiden: Brill, 2006), pp. 487-523, and M. Allen, *Mints and Money in Medieval England* (Cambridge: Cambridge University Press, 2012), 131-3; Blackburn, 'Currency under the Vikings, Part 2', 216 summarises work on the Viking coinages so far.

⁷ Blunt, Stewart and Lyon, *Coinage in Tenth Century England*, is maddening in its lack of full publication of data, and although to have done so would have created an overly lengthy volume; the value of the raw data cannot be underestimated for use in any new forms of die calculations that are published.

the Swordless St Peter coinage, drawing on published corpora of coins for the York Regal coinages (that is, coins of Cnut, Siefred and Æthelwold), and for the Anglo-Saxon Circumscription Cross and Cross Moline coinages from all mints except York.⁸ I have also had access to data from three large Anglo-Saxon mints: Lincoln, Winchester and York. The Lincoln data were published in 1970, the Winchester data have been kindly given to me ahead of publication in 2011 by Stewart Lyon, and the York data have been collated by William Lean and used here, but will remain unpublished for the foreseeable future whilst he continues adding to his corpus.⁹ These studies were undertaken some years ago and there are doubtless new additions to each corpus that have not been taken into account, but the addition of these new coins to the corpora is beyond the scope of this thesis in the present state of publication. The data from York, Lincoln and Winchester are important because they can be used to compare the coinages of Viking York with the mint of York under Anglo-Saxon control through to the twelfth century, and to see the die use in York compared to that in other major Anglo-Saxon mints. It must be remembered though, that in comparing the numbers of dies from Viking York, the mint of York is, in most cases, the only mint producing the coins in question, whereas in Anglo-Saxon England there were several mints active, with thirty-five mints under Æthelstan and perhaps twice that number under Æthelred II.¹⁰ So the comparisons offered here are between the York mint and individual Anglo-Saxon mints, rather than between the overall output of the Viking and Anglo-Saxon kingdoms.

⁸ These coin types have been discussed in Chapter 2; also see Lyon and Stewart, 'Northumbrian Viking Coinage', p. 106; Blunt, Stewart and Lyon, *Coinage in Tenth Century England*, pp. 229-34.

⁹ Some of the York data is available in C.S.S. Lyon, 'Minting in Winchester: An Introduction and Statistical Analysis', in *The Winchester Mint and Coins and Related Finds from the Excavations of 1961-71*, ed. by M. Biddle, Winchester Studies, 8 (Oxford: Clarendon Press, 2012), 3-54.

¹⁰ M.A.S. Blackburn and C.S.S. Lyon, 'Regional Die-Production in Cnut's Quatrefoil Issue', in *Anglo-Saxon Monetary History: Essays in Memory of Michael Dolley*, ed. by M. Blackburn (Leicester: Publisher, 1986), pp. 223-7.

The wider questions about how to estimate the number of dies used in a coinage have been pursued in numismatic, historical and archaeological journals over the last fifty years.¹¹ Research has asked how many coins were minted and how many coins were in circulation in a given period. Yet answering these questions is a deceptively difficult job, which many have tried to do, and have been criticised for trying.¹² For numismatists, undertaking a die study is the equivalent opus and true test of their skill at the subject as producing an historical edition is for the historian, or publishing an excavation monograph is for the archaeologist. The undoubted master of the die study is Brita Malmer, who has published her vast die studies of the Swedish Anglo-Scandinavian coinage produced in c.995-1005, and with the number of coins in her sample of 3,927 coins.¹³ Smaller studies using similar methods have been done for other coinages from various branches of numismatics from the coins of the ancient Greeks, to the Indian Kushans.¹⁴ The Anglo-Saxon and Viking coins of tenth-century England have been the subject of much detailed numismatic study, and the record of die studies for this period is remarkably complete, with only a few gaps in the

¹¹ Key articles in the debate include Metcalf, 'How Large Was the Anglo-Saxon Currency?', Grierson, 'Volume of Anglo-Saxon Coinage', C.S.S. Lyon, 'Analysis of the Material', in *The Lincoln Mint, c.890-1279*, ed. by H.R. Mossop (Newcastle-upon-Tyne: Corbitt & Hunter, 1970), pp. 11-19; Buttrey, 'Calculating Ancient Coin Production', Buttrey with Cooper, 'Calculating Ancient Coin Production II', De Callatay, 'Seeing a Balance', G.F. Carter, 'Comparison of Methods for Calculating the Total Number of Dies from Die-Link Statistics', in *PACT 5: Statistics and Numismatics: Papers from a Round Table of the Centre de Mathématique Sociale de l'École des Hautes Études en Sciences Sociales de Paris, 17-19 September 1979*, ed. by C. Carcassonne and T. Hackens (Paris: Council of Europe, 1981), pp. 204-213, W.W. Esty, 'Estimation of the Size of a Coinage: A Survey and Comparison of Methods', *Numismatic Chronicle*, 146 (1986), 185-215, and R. Bracey, 'The Coinage of Wima Kadphises', in *Gandhāran Studies, Volume III*, ed. by M. Nasim Khan (Peshawar: Ancient and Medieval Gandhāra Research Group, 2009), pp. 25-74.

¹² Metcalf, 'How Large Was the Anglo-Saxon Currency?', 475-82, was criticised by Philip Grierson in his 'Volume of Anglo-Saxon Coinage', pp. 153-60.

¹³ B. Malmer, *The Anglo-Scandinavian Coinage c.995-1020*, *Commentationes de Nummis Saeculorum IX-XI in Sueca Repertis, Nova Series*, 9 (Stockholm: Royal Swedish Academy of Letters, History and Antiquities, 1997).

¹⁴ The definitive die study for Greek coins is O. Mørkholm, *Early Hellenistic Coinage: From the Accession of Alexander to the Peace of Apamea (336-186 B.C.)* (Cambridge: Cambridge University Press, 1991); R. Bracey discusses the theory of die studies as well as presenting his own in 'Wima Kadphises', pp. 25-74.

data.¹⁵ Unfortunately, although there have been these many die studies of the Viking coinages, not all of the data are published, and where it is, the small number of extant coins has led to problems of very small samples and poor statistical data. This means that although comparisons can be undertaken between the Viking and Anglo-Saxon coinages, the limitations of the evidence must always be remembered. Due to this shortage of good data, examples from other tenth-century and later English coinages of the later tenth to mid-twelfth centuries will be used as comparisons. Despite the dislocation of time or place in the manufacture of some of this comparative material, the production method was still the same, so it is a fair comparison.

Undertaking a Die Study

To start a die study, images of all known extant coins of a particular coinage must be collected. This may vary from a handful of coins, as seen with Rægnald's coinages from York c.919-c.921, or it may be a staggeringly large number (3,927), such as Malmer's Anglo-Scandinavian coinage, which was produced in c.995-921 in Sweden.¹⁶ This corpus forms the sample for the statistical work for the die study, and so at a basic level it can be expected that the larger the sample, the better the results are likely to be. A more sophisticated measure of the completeness of the sample in proportion to the number of coins and dies originally made is the number of coins that were used per die. This is expressed mathematically as n/d , where n is the number of coins and d is the number of dies in the sample. This n/d figure is a very important indicator of the likely statistical level

¹⁵ Blackburn, 'Currency under the Vikings, Part 2', 216.

¹⁶ Blunt and Stewart, 'Coinage of Regnald'; Malmer, *Anglo-Scandinavian Coinage*, p. 17.

of error in the sample; it is usually a number between one and ten, and a score of two or above is generally accepted as the minimum value that will yield statistically valuable results.¹⁷ Below this number the results can be used, but there will be a high level of error in all calculations, which is often manifested as a very wide range of results. Since there are two dies used to make every coin, there will be two figures for the coins per die (n/d) values, and d can be expressed as 'do' for obverse dies in the sample, or 'dr' for reverse dies. In their calculations and analysis, most scholars use the value for the obverse die and not the data from the reverse die. Here the obverse die will be used as the main estimate of comparison because the obverse die is the lower die, which receives less force from each blow in striking coins, and means that an obverse die will last longer and is a more stable measure of a coinage than the reverse (upper) die, which is more frequently damaged and replaced. However, some scholars, such as Blunt, Stewart and Lyon, and Allen, have used data from reverse dies because in many similar-looking coin types, such as the late-tenth-century Two Line and the later medieval Short Cross types, the reverse is the most easily distinguishable die, as the moneyer and mint are named on the coins enabling faster identification of reverse dies than the obverses.¹⁸

Once a corpus of images is collected, the numismatist will compare each coin with the others to identify the different obverse and reverse dies. Since two dies are used to make a coin, the obverse and reverse of each coin must be examined and compared with the obverse and reverse die on each of the other coins. Since each die was individually engraved, it can be identified by careful examination of a coin, and the features, such as

¹⁷ Bracey, 'Wima Kadphises', p. 27.

¹⁸ Blunt, Stewart and Lyon, *Coinage in Tenth Century England*, pp. 181-90; Allen, *Mints and Money*.

formation or position of lettering or design elements, as well as the artistic skill or style of an individual die engraver, can be identified. The list of all the different obverse and reverse dies identified forms the die corpus, and the numbers of coins in the sample (n) and the numbers of dies (do and dr) are used for the calculations below.

The creation of a corpus is complicated by the fact that the numismatist will inevitably be dealing with photographs of the coins rather than the actual objects, due to the scattered nature of their repositories in museums and private collections throughout the world. Luckily, photography is usually of a high standard and since around 2003 most major coin auctioneers have used colour photography in their catalogues, which gives added information on the condition, levels of corrosion and patination of the coin.¹⁹ Unfortunately, some coin types have traditionally been considered less interesting because of their plain designs, low price or sheer ubiquity and have been neglected by auctioneers and rarely deemed worthy of photography in auction catalogues. For example, the Swordless St Peter coin type was long neglected by auctioneers as an uninteresting Viking coin compared with the wonderful iconography of the Raven or Sword types of the 920s and 940s, and up until the 1970s was rarely photographed at all for sale by auction. In this case, a description of the coin can be of some use, or the coin can even be traced when it was sold at a later date in a sale with photographs, but a coin without an image must be excluded from the die study sample. There are also some limitations in coin photography, mainly due to poor lighting of the coin or images that are of low resolution.²⁰ The former is a particular problem with the Copenhagen *SCBI* catalogue illustrations, as lighting from

¹⁹ The annual publication by Spink, *Coins of England* used colour images in this catalogue from 2006 in the 42nd edition.

²⁰ Bracey, 'Wima Kadphises', p. 26.

the wrong angle makes the coins appear to be incuse rather than the lettering and designs being in relief.²¹ This causes problems when trying to compare very similar coins to see if they were produced from the same dies. Some catalogues also use an old photographic standard whereby a cast of the coin was photographed, as this gave a much clearer impression of the coin than the coin itself. Unfortunately, it also gives an inverse impression, rather than relief of the coin and any coloration or visual information regarding the coin's condition is lost. Problems caused by low resolution include pixellation of the image when it is viewed under the high magnification that is sometimes necessary when looking at the detail of a coin.

The process of identifying the dies is, by the very nature of the process, subjective and relies upon the familiarity of the numismatist with his or her material, and the quality of that material. Figure 3.3 shows how coins which look similar can be identified as being made from different dies. The coins of the Vale of York hoard were initially identified prior to any conservation or cleaning work that would make the coins easier to identify but could affect their value as they went through the Treasure process, in which the hoard was reported, recorded as part of the Portable Antiquities Scheme and then valued by a panel of external experts.²² Whatever the condition of the coins or the problems with photographs of the source material, the numismatist will attempt to distinguish coins made from different dies by the style of the lettering and ornament, as well as focusing on individual tool marks used to create the die, in order to differentiate coins produced by different dies.

²¹ G. Galster, *Royal Collection, Copenhagen. Part I, Ancient British and Anglo-Saxon Coins*, Sylloge of Coins of the British Isles, 4 (London: Published for the British Academy by the Oxford University Press and Spink & Son, 1964).

²² Department of Culture, Media and Sport, *The Treasure Act 1996: Code of Practice*, 2nd Revision, pp. 65-70, available from http://finds.org.uk/documents/treasure_act.pdf [accessed on 3 September 2011].



Figure 3.3 Two seemingly-identical coins made from different dies.²³ Coin a has a contraction mark above the obverse inscription, whereas coin b has this contraction mark transformed into a key. Both coins have crosses above and below the obverse inscription and three pellets between, but the pellets are more widely spaced on coin b. The lettering on the obverse of coin a is not level compared with the straight line inscription of coin b. The reverse inscriptions on these coins differ with a reading EBORACECIV and b reading EBORACECI followed by a Mercian-style curved M.

Unfortunately, however skilled the numismatist may be, a proportion of coins from the corpus may be so worn or corroded from time in the ground that it is exceedingly difficult or impossible to identify them as coins of the type being studied, let alone distinguish tiny features of the die. Malmer found that around forty percent of her sample were unintelligible and could not be assigned a die number.²⁴ The way in which the coin is struck can also affect how it looks, and two coins struck from the same die may look different because of the differing pressure exerted by the moneyer when he struck the coin. The next obstacle for the numismatist is eliminating coin duplicates from the sample - that is, coins that are actually the same object but have been inadvertently entered into the corpus more than once because they have different provenances and have appeared in several different auctions or sales. This is sometimes easy to resolve by further

²³ EMC coins: 1011_33 and 1009_229.

²⁴ Malmer, *Anglo-Scandinavian Coinage*, p. 17.

investigation into the provenances the coins, or sometimes a coin may have a particular unique nick or damage to the metal which identifies the two images as one coin.

Analysing the Results of a Die Study

Once a die corpus is formed, it can be examined in different ways, but many numismatists use the visual representation of a die link diagram.²⁵ This shows the links between all the obverse and reverse dies, and can give, at a glance, an understanding of the working practices at the mint where the coins were made, and some indication of the length of time the coin type was issued for. A pattern of very few die links can show that a pair of dies was always collected at the start of work and used as a set until one wore out and was replaced by a new die, whereas complicated links and patterns between obverses and reverses it shows that dies were picked at random at the start of work each day. A diagram with many die groups, that is groups of obverse and reverse dies linked together by being used on different coins, can show that a coin type was produced for a long time. Where coin types were struck for years and years, one would expect to see signs of dies wearing out and being replaced with new dies. It is even possible with some coinages to trace individual dies as they wear and crack through use, and the dies they were replaced with, which can give a chronology for phases and styles within a coinage.²⁶ Where a coinage is short-lived, perhaps only a few dies were used in total. Thus, the die link diagram and the

²⁵ Such as M. Allen, 'The Provision and Use of Short Cross Class V Dies', *British Numismatic Journal*, 59 (1989), 69-73.

²⁶ Bracey, 'Wima Kadphises', p. 38.

information it contains can be used to interpret both the length and chronology of a coinage and the way in which the coins were produced in the mint.²⁷

Group IX: Olaf's late CC type

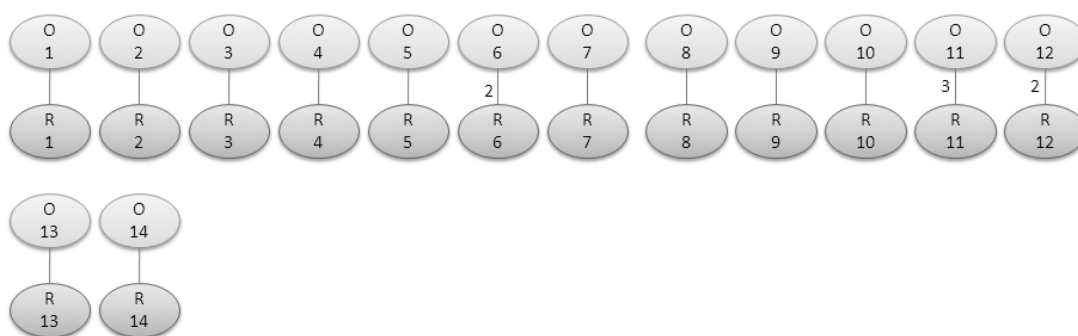


Figure 3.4 This schematic diagram of the die links in Olaf Sihtricson's late Circumscription Cross coinage shows that there are no instances where an obverse die was used with more than one reverse die and vice versa.²⁸ This is most likely a result of the small sample size, which is only fourteen coins.

The diagram above, however, shows a coinage, Olaf Sihtricson's Circumscription Cross type from the late 940s, and the dies used to strike the extant coins (Fig. 3.4). There are no die links as each coin was struck by a unique obverse paired with a unique reverse. A die link is not the relationship between an obverse and reverse die, which is a die combination, but the relationship between, for example, an obverse die with another obverse die, which have both been used to strike a common reverse. As the sample here is small, it is difficult to interpret the data with any degree of statistical certainty. The pattern could mean that dies were issued as pairs and when one die was broken, both dies were discarded. However, this would have been a rather prodigal waste of good iron dies. It is more likely

²⁷ Bracey, 'Wima Kadphises', p. 28.

²⁸ Data from Blunt, Stewart and Lyon, *Coinage in Tenth-Century England*, p. 233.

that this pattern is the result of the small number of coins in the sample; more coins would probably have provided links between various obverses and reverses, showing that dies were replaced over time as they wore out. The interpretation of this coin type must, therefore, remain uncertain until more coins of this type are found and can be analysed. The nature of numismatic evidence and the popularity of metal detecting as a hobby mean that new coins are found regularly; for example a corpus of the Sword coinages of the 920s had just been published when the Vale of York Hoard was discovered and added twenty six new coins to the corpus.²⁹

This pattern of simple die link diagrams is seen with many of the Viking coinages of York, with very few links or no links appearing between dies. The full data, which have been reconstructed from published die corpora, can be seen in Appendix II. The Swordless St Peter coinage, c.905-c.919 presents a more complex picture. In die link diagram terminology, an isolated obverse, shown below in Figure 3.5, is an obverse die that was combined with more than one reverse die, but is not linked to any other obverse dies through any of the reverses. An isolated reverse die is the same but the reverse die is isolated from other reverse dies instead. The most striking thing about the Swordless St Peter coinage was that the initial diagram showed many more isolated reverses than isolated obverses. Given that it is known that reverse dies wear out more quickly due to their position on top of the coin blank and being the die that receives the force of the blow, we know that it is a physical fact that there will be more reverse dies than obverse dies for any coinage, and in the mint a reverse die would be used with an obverse die until it wore

²⁹ Blackburn, 'Currency under the Vikings, Part 2', 222-5.

out, when it would be replaced by a new reverse die. For a normal coinage the expected pattern would, therefore, be one with more isolated obverses than isolated reverses.

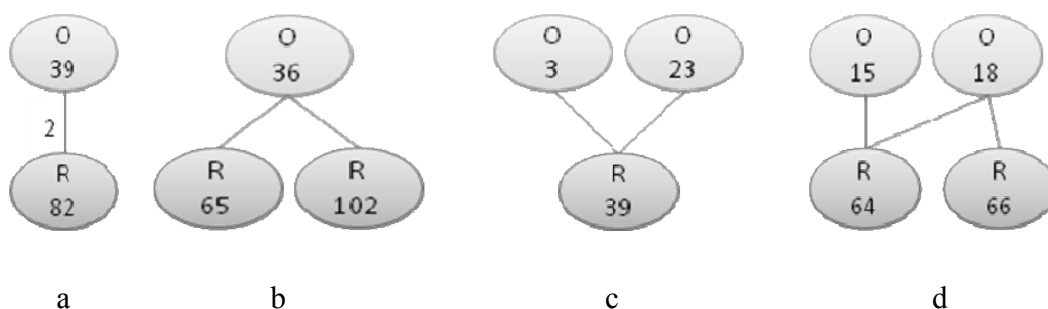


Figure 3.5 How to read a die link diagram. O indicates an obverse die, and R a reverse die, a) a simple die combination, the small number beside indicates that two coins are known from this combination of dies, b) an isolated obverse where one obverse was combined with two reverses, but those reverses were not linked with any other obverse dies, c) an isolated reverse, d) a die group, where two obverses are linked to each other as they were used to strike different coins with the same reverse, and one of those obverses also struck coins with another reverse.³⁰

The Swordless St Peter die link diagram initially showed an unexpected pattern with far more isolated reverses than obverses. This means that what was normally called the reverse was in fact the obverse of this coin type, as can be seen in Figure 3.6 below, and the labeling of obverse and reverse throughout this work has been adjusted to reflect this.³¹ Identifying the obverse and reverse of a coin is only one of the uses of a die study, and one that can be identified quickly and easily from a die link diagram. The next step in die link analysis is to look at the number and complexity of links within groups. Within many of the Viking coinages of York, the sample of coins is so small that there are very few, if any

³⁰ All examples are from the Swordless St Peter type and can be found in the full die link diagram in Appendix II.

³¹ This identification can be seen in standard catalogues, such as Spink, *Coins of England*, number 1006, and North, *English Hammered Coinage*, numbers 551-554.

die links. The Swordless St Peter coinage, however, contrasts with other Viking data in that there are more die links and groups of links. There are the isolated obverses and some isolated reverses as mentioned above, and also some more complex groupings. For example, in Figure 3.7 below, it can be seen that two obverses were linked through several different reverse dies on a series of coins. Yet compared with die studies of other coin types, notably Malmer's study of the Anglo-Scandinavian types, there are still very few die groups containing very simple die links in the Swordless St Peter type. Malmer's data, along with similar die studies on Greek and Kushan coinages, produced pages of complex webs of die links in which the life of individual dies could be traced, and chronologies built around this data.³² The Viking data do not support such chronological interpretation as there are not enough dies and not enough links between them in any of the coin types.

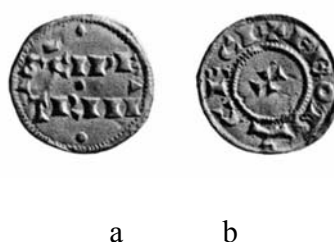


Figure 3.6 The obverse and reverse of a Swordless St Peter coin. The SCI PETRI M inscription (a) is in fact the reverse of the coin, not, as assumed previously, the obverse. It was commonly thought to be the obverse on this coin type because there was no king's name and it was assumed that the saint's name fulfilled the same role as the regnal attribution on the obverse of contemporary coin types.

What can the pattern revealed by the die link diagram expose about the mint in the early tenth century at York if not chronological information? From the diagram below for the

³² Malmer, *Anglo-Scandinavian Coinage*; Mørkholm, *Early Hellenistic Coinage*; Bracey, 'Wima Kadphises', pp. 25-74.

Swordless St Peter type it can be tentatively said that the mint had a good control over which dies were used. Obverses and reverses appear to have been issued in pairs rather than at random, and dies were only replaced when they were worn out. However, the high numbers of single die combinations, although lower than found in other Viking coinages, means that these interpretations are only tentative and may change if more coins of this type are found in the future.

Swordless St Peter die links

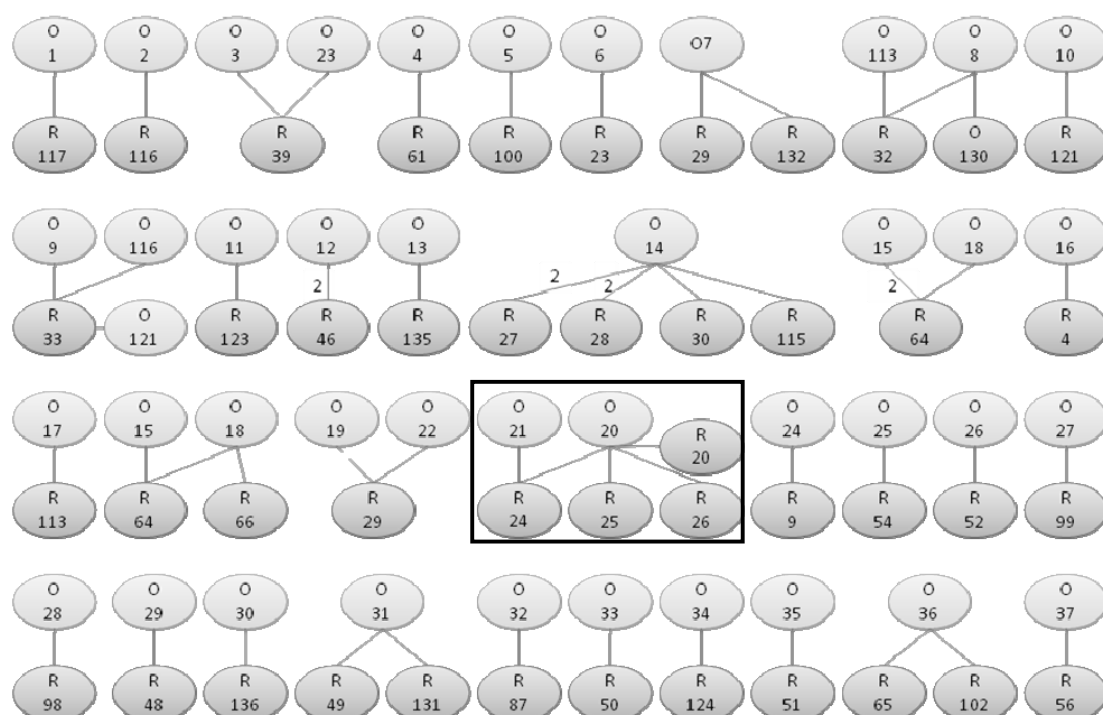


Figure 3.7 This is part of the schematic die diagram for the *Swordless St Peter* coinage. In contrast to Figure 3.4 above, there are various die groups as well as simple die links. Here a more complex situation is highlighted by a box, where dies O21 and O20 are linked to each other by both having been used in combination with R24. In addition, O20 was also used in combination with R20, R25 and R26.

The die link diagram is, therefore, a useful tool for giving an overview of the structure of a coinage and of the likelihood that results will be statistically significant. Die link diagrams can also be useful in interpreting the chronology of a coinage, and the practices within the mint where the coins were made, but further work is needed to understand the volume of a coin type.

Calculating a Die Estimate

Ideally, the sample of coins used in every die study would be a completely random one, but the factors of coin survival and recovery are not random. This is a useful reminder that the numismatist is dealing with real objects and data and not a mathematical theory. Single-find evidence consists of data about single coins, which are usually found by metal detectorists or during archaeological investigations. These data are normally assumed to be random, as these coins are thought to have been dropped and lost during trade or other exchanges. In later medieval England, for example, gold coins and high value silver coins would be far more likely to be searched for if dropped than a lower denomination coin, especially since in medieval England each coin, even a low denomination one, would buy far more than small change today, and would represent a substantial loss to the individual who dropped it.³³ In the Viking and Anglo-Saxon period there was only one real denomination: the penny, as well a small number of cut or round halfpennies, each coin worth a fair amount and likely to have been searched for when dropped. Single finds are not always the result of random loss either, as coins have been found used in ritual contexts

³³ J.C. Moesgaard, 'Single Finds as Evidence for Coin Circulation in the Middle Ages: Status and Perspectives', *Nordisk Numismatisk Årsskrift* 2000-2, 8 (2006), 235.

from later periods, such as with burials, in foundation stones of buildings, and folded over for some ritual offering.³⁴

This means that even if the coin corpus used for a die estimate was composed purely of single finds, it would not be a random sample. In fact, most corpora are composed of coins mainly from hoards. Early die studies proposed that a hoard could be used as a sample for study, but the non-random nature of a hoard has meant that this is no longer good practice in die estimation.³⁵ In the early Viking period, one hoard dominates: the Cuerdale hoard, which was deposited c.905 and is composed of around 7,500 coins and around 1,000 items of bullion.³⁶ As a result of the extraordinary size of this hoard, most of the known examples of Viking coins of the late-ninth and early-tenth centuries come from this one source. Had this hoard not been discovered we would have a very small sample indeed to work with. As well as the problem of hoards skewing a sample, hoards are themselves inherently non-random. They are a product of selected saving done at a particular point in time and geographical location, that is, coins in a hoard are usually taken from circulation on one or several particular days and taken from the coinage in local circulation, and perhaps chosen for the style or condition the coin is in rather than purely random monetary considerations. Hoards are more likely to contain multiple coins from the same source and dies. If coins were bought at the mint and then placed soon after into a savings hoard, the coins in that hoard are more likely to have been struck at the same time from the same dies

³⁴ R. Kelleher, 'The 'English Custom': Folding Coins in Medieval England', *Treasure Hunting Magazine* (April 2010), 79-82; Moesgaard, 'Single Finds as Evidence', 247-50.

³⁵ Metcalf, 'How Large Was the Anglo-Saxon Currency?', 477, an idea rejected by Grierson, in 'Volume of Anglo-Saxon Coinage', p. 155.

³⁶ E. Hawkins, 'An Account of Coins and Treasure Found in Cuerdale', *Numismatic Chronicle*, 5 (1842-3), 1-104; J. Graham-Campbell (ed.), *Viking Treasure from the North West: The Cuerdale Hoard in its Context* (Liverpool, 1992), p. 10; Williams, 'Cuerdale Coins', pp. 39; Blunt, Stewart and Lyon, *Coinage in Tenth Century England*, p. 25.

or similar dies. There is little that can be done about the non-random nature of coin sample, except to acknowledge and understand the impact that this might have upon the die calculations, which are based on the assumption that the sample is a random one.

There are further factors which affect the composition of the corpus of coins. The establishment of the Portable Antiquities Scheme has encouraged responsible metal detecting and given scholars access to a wide range of single finds and hoards, but the data in the *PAS* are skewed both towards the counties that have been longest established in the scheme, and areas of the country in which the land is commonly used for agriculture.³⁷ Finding all extant coins of a particular type involves detailed work searching museum catalogues, existing corpora such as the *Sylloge of the Coins of the British Isles* series, auction sales catalogues, coin auction websites, fixed price lists issued from coin dealers, antiquarian accounts of new discoveries, Portable Antiquities Scheme data and Annual Treasure Reports.³⁸ Even the most diligent researcher may miss some coins for their corpus, and the recent growth in online auction sites such as Ebay has made monitoring all coin sales extremely difficult. Another factor making identification difficult is the nature of the coin trade. Coins can circulate within that trade more than once, and the same coin may be seen passing through the sales catalogues again and again, even gaining added value by virtue of having been owned by a renowned collector. For example, one Swordless St Peter coin made in York between c.905 and c.919, passed through several celebrated collections, having being owned by Boyne until 1896 and then the great collector Carlyon-Britton until 1916, passing through a Spink fixed price list again in 1946

³⁷ S. Worrell, 'Finds Reported under the Portable Antiquities Scheme', *Britannia*, 37 (2006), 429-31.

³⁸ *SCBI* data is available through the *EMC*; *PAS*; Treasure Reports are available from <http://finds.org.uk/treasure> [accessed 15 September 2011].

before finding a permanent home in Merseyside County Museums.³⁹ This is good news for the coin dealer but makes it harder for the numismatist when it comes to identifying whether two coins are different coins made from the same die or merely the same coin from two separate sources.

Once the corpus is collected and the dies have been compared, it is time to estimate the number of dies that were once used to produce the coin type being investigated. The temptation is to go further and then to estimate how many coins were made with these dies and how many coins were originally in circulation. This next step is one that is so fraught with statistical difficulties that it is generally considered impossible.⁴⁰ The main problem is that there is no way to estimate how many coins a die could strike. There is an assumption that this basic action of striking a blank between two dies was repeated until the dies wore out, and new ones were used replaced them. However, this is not necessarily the case as minting was not a continuous operation in most medieval societies, and certainly not in England, until at least the mid-eighteenth century.⁴¹ Work was undertaken periodically according to demand from the monarch or the state, and minting was done for preference in the summer months when workers' fingers were warm and nimble enough to manipulate the small coins. Minting only occurred when it was needed, and did not necessarily happen every year if no coins were required by the government or no

³⁹ EMC coin: 1029_423; Spink, *Numismatic Circular*, 54 (February 1946); P.W.P Carlyon-Britton, *Sotheby's Sales*, 20th November, 1916 (lot 871); W. Boyne, *Sotheby's Sale*, 29th June, 1896 (lot 1107).

⁴⁰ A bombastic debate on this subject was had by Buttrey and de Callatay in the *Numismatic Chronicle*: Buttrey, 'Calculating Ancient Coin Production', Buttrey with Cooper, 'Calculating Ancient Coin Production II'; De Callatay, 'Seeing a Balance'.

⁴¹ C.E. Challis, 'Lord Hastings to the Great Silver Recoinage, 1464-1699', in *A New History of the Royal Mint*, ed. by C.E. Challis (Cambridge: Cambridge University Press, 1992), pp. 344-5 shows the seasonal variation in mint output over several years.

individuals brought in silver to be coined.⁴² Even during a long period of minting, dies were not all used to the same capacity. If, for example, a monarch issued a new coin type with a new name, design or title, the old dies were obsolete before they were used to destruction. In small mints or in years of low demand for coinage, a die may not have been used until the shaft was too short to hold or the die face worn out.⁴³ The Durham House mint is an example of a small mint that was only in operation for two years under Edward VI, and certainly never used all its dies to a state of wear in that time.⁴⁴ The used medieval dies in the National Archives, one of which is shown below in Figure 3.8, shows that some dies were retired from use in better conditions than others, as they have varying lengths of reverse dies and wear on the face of the dies.⁴⁵ These factors mean that any calculations of the number of original dies must take into account that not all dies were used equally, and not all dies were used to their full capacity.

⁴² Challis, 'Lord Hastings to the Great Silver Recoinage', pp. 199-205 shows the variation in annual mint output.

⁴³ Buttrey with Cooper, 'Calculating Ancient Coin Production II', 343.

⁴⁴ C.E. Challis, *The Tudor Coinage* (Manchester: Manchester University Press, 1978), p. 100.

⁴⁵ D. Allen, 'Dies in the Public Record Office, 1938', *British Numismatic Journal*, 23 (1938-41), 31-50; London, National Archives, E/29/1/1-192.

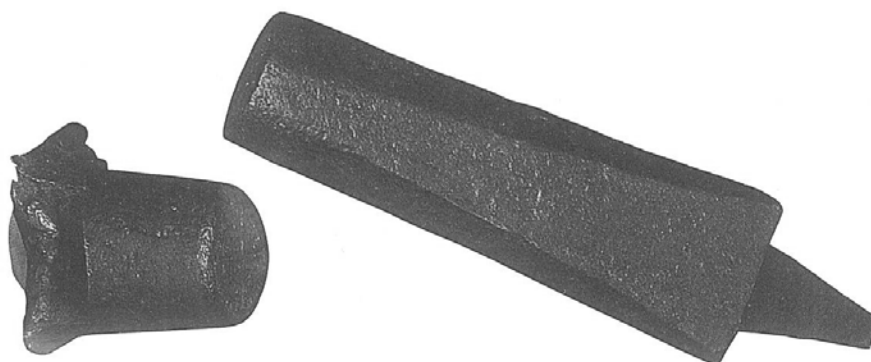


Figure 3.8 York halfgroat dies dated c.1353 – 1355.⁴⁶ The upper (reverse) die on the left has been used as can be seen by the damage at the top of the die, and the short length of the die shaft compared to the lower (obverse) die. This ‘mushrooming’ of metal is caused by the repeated action of the hammer upon the iron die.

There have been attempts to use data about the numbers of coins struck from dies that are recorded in the historical records. These numbers of coins struck range from 2,000 to 70,000 per die, with a medieval norm of anything from 5,000 to 30,000 coins per die.⁴⁷ Rates of 10,000 coins per reverse die were known under Edward I, and 14,000 per die under Edward II at the Tower of London Mint.⁴⁸ Even mints making the same types of coins at the same times have wildly differing rates, with around 30,000 coins per obverse and 15,000 per reverse at Newcastle and 72,000 per obverse and 24,000 per reverse during the 1300-2 recoinage under Edward I.⁴⁹ Some scholars have suggested that a constant number is used, such as an estimated figure of 10,000 coins per die, to give an idea of the

⁴⁶ Image from G. P. Dyer, *The Royal Mint: An Illustrated History* (Cardiff: Royal Mint, 1986), p. 9. This pair of dies is from the Royal Mint Museum collection but was part of the same group of dies which were found in the Chapel of the Pyx at Westminster Abbey and distributed between the National Archives, British Museum and Royal Mint.

⁴⁷ De Callatay, ‘Seeing a Balance’, 300; B.H.I.H. Stewart, ‘Second Thoughts on Medieval Die-Output’, *Numismatic Chronicle*, 7th Ser., 4 (1964), 303.

⁴⁸ D.M. Metcalf, ‘A Survey of Numismatic Research into the Pennies of the First Three Edwards, 1279-1344, and their Continental Imitations’, in *Edwardian Monetary Affairs*, British Archaeological Reports, British series, 36, ed. by N.J. Higham (Oxford: BAR, 1977), p. 27.

⁴⁹ Stewart, ‘Medieval Die-Output’, 293.

scale of coin output for a coin type.⁵⁰ This method adds nothing to the die estimates except for some noughts, and in any case with the average die output ranging so widely, this arbitrary figure is almost certainly wrong. Thus, even if the coin-striking capacity of medieval dies of a particular coin type was known, the estimate would still be subject to a huge rate of error, since the variables are so many and the capacity of a die was not a constant number. The skill of the engraver, the thickness, size and relief of the coin blank, the force of the hammer blow, the decision as to when a die should be discarded, whether dies were used to destruction, the length of the die shaft, the temperature of coin blanks at striking, and the care taken of the dies during and after striking all affect the number of coins a die could strike, making an estimate of the number of coins produced impossible.⁵¹ The central problem is that there is no constant number of coins a die could strike and it is futile to create a calculation that insists upon multiplying the die estimate by any constant number.⁵² The one benefit to non-numismatists of attempting to calculate the number of coins struck is that it gives some indication of the scale of the coinage. However, any benefit is more than outweighed by the potential room for error in this calculation. Instead the calculations should end with the estimated numbers of dies, and the scale of production should be given by the comparison with other data estimates calculated with the same methods.

⁵⁰ D.M. Metcalf, 'A Sketch of the Currency in the Time of Charles the Bald', in *Charles the Bald: Court and Kingdom*, ed. by M.T. Gibson and J.L. Nelson (Aldershot: Variorum, 1990), p. 91; Allen, 'Volume of the English Currency', pp. 487-9.

⁵¹ Buttrey, 'Calculating Ancient Coin Production', 342; Buttrey with Cooper, 'Calculating Ancient Coin Production II', 343-4.

⁵² Bracey, 'Wima Kadphises', pp. 49-50.

The die estimates themselves utilise various parts of the data from the die corpus. The key data that are used are the number of coins (n) and the number of dies (d), which are used to calculate the number of coins per die (n/d); this has already been used above as an index of how statistically viable the data are. Because there are two dies, the value d can be used for either the obverse dies (d_o) or reverse dies (d_r). In this analysis, the calculations for both obverse and reverse dies have been undertaken, but only the obverse values have been used in further analysis as these dies wore out less quickly than the reverse dies. The final key data in the following calculations is the number of dies that are represented only once ($F1$); again this can be done for the obverse ($F1_o$) or reverse ($F1_r$).⁵³ These data provide the numbers for the estimate of the number of dies used for a particular coin type, which is done using formulae developed for die analysis, the three most popularly used being those developed by Esty, Good and Carter.⁵⁴ The results of these calculations give a range of estimates of how many dies were used to make an entire coin type, which are expressed as D_o (obverse) or D_r (reverse). The difference between d_o and D_o is that d_o means the actual number of dies in the sample, and D_o means the estimated number of dies that were used to produce all the coins in the type in question.⁵⁵ A similar notation is used for n and N where the former represents the number of coins in a sample, and the latter is the number estimated to have been made originally.

⁵³ Ibid., p. 27.

⁵⁴ Esty and Good's calculations are listed in W.W. Esty, 'Estimation of the Size of a Coinage: A Survey and Comparison of Methods', *Numismatic Chronicle*, 146 (1986), 185-215; G.F. Carter, 'A Simplified Method for Calculating the Original Number of Dies from Die Link Statistics', *American Numismatic Society, Museum Notes* (1983), 195-206; Buttrey with Cooper, 'Calculating Ancient Coin Production II', 341.

⁵⁵ Note that lower case (d) is used for extant data and upper case indicates estimated figures (D).

In this thesis, three methods of estimating the number of dies used for a particular coin type, known as Esty, Good and Carter, after the names of their proponents, which are based upon different theoretical hypotheses, will be used. The use of the three methods is important, as each is based on slightly different numismatic and mathematical assumptions, so rather than just relying on one method, three are compared and analysed together. The die estimates (Do in this case) will then be expressed as a range, calculated by taking the lowest and highest estimates from the three formulae. To put the die estimate in context, a further calculation is often done in which the number of dies over time, in this case per year (Do/t , where t = time in years), is calculated, so that one can compare a coinage issued for thirty years with one issued for two. Again, because of the variation of die estimates created by using three separate calculations, Do/t is often expressed as a range, such as 250 to 470 dies per year for the Swordless St Peter coin type, which can then be compared to other Do/t ranges to be meaningful.

Another calculation that will not be used here but has been used amongst Anglo-Saxon numismatists in particular is a formula by Esty, which will be known here as Esty 2006.⁵⁶ Whilst the method used in the current analysis uses the three calculations by Esty, Good and Carter, which are based upon different statistical assumptions, and then takes an average of the results, the Esty 2006 formula contains a measure of accuracy within its own calculations. Esty calls this the confidence limits, which means there is a 95 per cent chance that the estimate given by the calculation falls within the range of these confidence limits. In using just one statistical method, the die estimate is based on only one set of

⁵⁶ W.W. Esty, 'How to Estimate the Original Number of Dies and the Coverage of a Sample', *Numismatic Chronicle*, 166 (2006), 359-60, used in Naismith, 'Southumbrian England', pp.154-5, and Lyon, 'Minting in Winchester', pp. 3-54.

theoretical assumptions, and although the confidence limits measure the likelihood of the known assumptions being correct, every die estimate method also contains a number of unknown assumptions, which the confidence limits cannot address. This is one way to look at both the estimate and the accuracy of the data, and there is much scope for future work in comparing the four calculations with different data to see which method is best for different sample sizes with different n/d figures. However, the Esty formula used here is much simpler, and given that three different formulae based on differing theoretical assumptions are used and compared, there is a useful range of data in the results. All the data for Viking, Anglo-Saxon and later coins, along with a glossary of terms can be found in full in Appendix III and have been subject to the same three methodologies.

Method 1: Esty

The basic assumption in many dies studies has been that the proportion of coins that are now extant is a representative sample, and that the number of dies used in comparison with this sample is a fixed number that can be calculated. As discussed above, we know that the extant coins of a coin type is not a random sample, but since all die studies face this same obstacle it is a factor that is important but universal in die studies (except for very modern coinages where all coins and dies are known). Two of the three methods used here, proposed by Esty and Good, are derived from this principle, and are based on mathematical methods and models. Throughout the following examples I will be using data from my own die study of the Swordless St Peter coinage, which has an n/d that is less than two. This means that the data are subject to a high rate of error and a fairly wide range of numbers should be expected from the following calculations.

The information needed to calculate a die estimate using Esty's method is the actual number of coins in the sample (n), as well as the actual number of obverse dies (do) and reverse dies (dr) that can be identified in that sample.⁵⁷ To estimate the number of obverse dies (Do) or reverse dies (Dr) that produced the entire coin type, Esty's method uses the following equation:

$$\text{Esty: } D = nd/n-d$$

So for example, the Swordless St Peter coins have the following values:

$$n = 163$$

$$do = 121$$

$$dr = 138$$

$$Do = (163*121)/(163-121) \quad Dr = (163*138)/(163-138)$$

$$Do = 470 \quad Dr = 900$$

This method nearly always results in a high estimate for the number of dies that were once produced and used, because it is based on the faulty assumption that all dies were used equally, in terms of how many coins they struck, and that they were used until they were too worn to strike coins any more, which we know was not the case.

⁵⁷ W.W. Esty, 'The Geometric Model for Estimating the Number of Dies', in *Quantifying Monetary Supplies in Greco-Roman Times*, ed. by F. De Callatay (Bari: Edipuglia, 2011), p. 57.

Method 2: Good

To try and balance this assumption to some extent, Good's formula adds an extra variable, the number of coins that are known as only one example from one die; this is known as a singleton or F1. This variable is used as it is more likely that singleton coins were made from dies that made fewer coins overall. This means that a number of coins that may have been struck by dies that were not used to full capacity is factored into an equation in which all the dies are assumed to have struck an equal number of coins. The use of the number of singletons thus mitigates the error that is known to exist in an equation that is based upon the assumption that all dies struck an equal number of coins.⁵⁸ His formula is:

$$\text{Good: } D = nd/n-F1$$

With the Swordless St Peter data:

$$n = 163$$

$$do = 121 \quad F1o = 84$$

$$dr = 138 \quad F1r = 109$$

$$Do = (163*121)/(163-84) \quad Dr = (163*138)/(163-109)$$

$$Do = 250 \quad Dr = 417$$

⁵⁸ I.J. Good, 'The Population Frequencies of Species and the Estimation of Population Parameters', *Biometrika*, 40 (1953), 237-64; the formula is also given in Carter, 'Comparison of Methods for', p.210 and in Esty, 'Estimation of the Size of a Coinage', p. 208.

These results are substantially lower than those of Esty. But this formula still rests upon assumptions based upon theoretical statistical understanding of dies and coin striking and the randomness of the sample used by the numismatist.

Method 3: Carter

A different approach was taken by Carter, who built a model of die estimation by using the extremely well-documented coins of Crepusius, a Roman moneyer who numbered his dies. Carter's method, unlike that of Esty or Good, is drawn from real data, not just a mathematical model. His approach builds in factors for error depending on how complete the data appear to be, and the equation changes slightly according to the n/d figure.⁵⁹ The factors by which the variables n and d are multiplied are drawn from Carter's data on the dies of Crepusius.

Carter: If $n/d = <2$	$D = nd/(1.214n - 1.197d)$
If $n/d = >2$ and <3	$D = nd/(1.0124n - 1.016d)$
If $n/d = >3$	$D = nd/(1.069n - 0.843d)$
If $n/d >4$	$D = 0.95nd/(n-d)$

⁵⁹ Carter, 'Simplified Methods for Calculating the Original Number of Dies', 204.

The Swordless St Peter data:

$$n = 163$$

$$do = 121 \quad n/do = 1.3$$

$$dr = 138 \quad n/dr = 1.2$$

$$Do = (163*121)/(1.214*163)-(1.197*121)$$

$$Do = 372$$

$$Dr = (163*138)/(1.214*163)- (1.197*138)$$

$$Dr = 688$$

This method usually produced an estimate that fell between Good and Esty's estimates. However, the method has a flaw in that Carter's method derives from a sample of real coins, while the numbers contained within the equation are based upon data from Roman coins. As a result, the equation can occasionally give a number of original dies (Do) that is actually less than the number of extant dies in the sample (do). This is the case with Malmer's Anglo-Scandinavian data, in which she identified 1,218 reverse dies (dr), but the Carter method estimates that there were only 838 reverse dies (Dr) in the entire coinage.⁶⁰ However, Carter's formula usually produces results that are feasible.

Using the example of the Swordless St Peter again, it can be seen that there is a range of estimates for how many dies were originally used in creating the coinage (Table 3.1). The

⁶⁰ Malmer, *Anglo-Scandinavian Coinage*, pp. 13-17.

Swordless St Peter coinage has an n/do of just 1.3, and is well under the ideal minimum of 2. This low measure of the completeness of the data indicates that a high rate of error is to be expected, and the range of the estimates below confirms this with estimates of the number of obverse dies originally used in producing the coin type ranging from 250 to 470 dies. The ratio of Do to Dr is an indicator of how many reverse dies were used with every obverse die. For the Swordless St Peter coinage the ratio is nearly one obverse to two reverses whichever die calculation is used. This figure confirms the evidence from the die link diagram above where a pattern of isolated obverses linked to more than one reverse was seen.

Table 3.1 Die estimates for the Swordless St Peter coinage. The data here tell us that there were between 250 and 470 obverse dies, and between 417 and 900 reverse dies. By comparing the number of obverse to reverse dies, we can also see that the ratio was nearly two reverse dies to every obverse die, which would be expected given the higher rate of wear of reverse dies in receiving the direct force of every blow.

Method	Do	Dr	Ratio Do:Dr
Esty	470	900	1.9
Carter	372	688	1.9
Good	250	417	1.7

On their own these numbers are not particularly useful and it may seem that die studies are riddled with so many caveats that the exercise is useless, and the statistical analysis may appear to be so cautious as to make conclusions impossible. Yet these caveats are not intended to dishearten, only to create awareness of the reliability of data and to make sure that anyone using it can be sure that they are comparing like with like and drawing sound conclusions. In the case of a die study it is necessary to be aware of the limitations of the

evidence, in both the assumptions behind die calculations and the ways in which die estimates can be reasonably used. If there is to be any understanding of the volume of Viking coin types, then it is to be achieved through comparison with data from other coin types.

Comparing Viking and Anglo-Saxon Die Study Data

To understand the volume of currency in the Viking kingdom of York it is necessary to compare the die estimates of different Viking coin types with each other and with types from the Anglo-Saxon kingdoms. This will give an understanding of how Viking coin production compared with that of its neighbours and how different Viking kings had different coin outputs. The main caveat that must be remembered in this analysis is that with many Viking coin types there are very few numbers of extant coins, with a very low measure (n/d) of completeness of the sample. This means that some Viking die estimates can appear tantalisingly close to other die estimates, but the n/d must be borne in mind at all times. This figure will be given in the tables below so that the reader can compare not only the die estimates, but the relative statistical comparability of those estimates for each coin type.

Table 3.2 Table showing dies per year estimates for the Viking coinages of York.⁶¹ The number of dies per year (Do/t) is highlighted in grey as this is the figure which will be compared. Note that the n/do is very low for all these coin types.

Coin type	Dates (years issued)	n	n/do	Do/t (Dies per year)
Regal (Cnut, Siefred and Æthelwold)	c.895-c.905 (10)	598	2.4	36-43
Swordless St Peter	c.905-c.919 (14)	163	1.3	18-34
Rægnald	c.919-c.921 (3)	23	1.1	40-121
Sword St Peter	c.921-c.927 (6)	83	2.2	10-12
Southern Sword types (Sihtric, Anonymous, St Martin)	c.921-927 (6)	29	1.2	177-371
Olaf Southumbrian (Cross Moline, Flower and Circumscription Cross)	c.940s (3)	12	1	Too low for a result
Olaf Raven	939-941 (3)	36	1.2	85-112
Triquetra/Standard (Olaf Sihtricsson, Rægnald II and Sihtric II)	c.942-3 (1)	20	1.1	95-190
CC/CM types (Olaf Sihtricsson, Rægnald II and Sihtric II)	c.942-3 (1)	16	1.2	26-35
Eric Two Line type	947-8 (1)	23	1.5	14-22
Olaf (restored)	c.940s (3)	26	1.2	20-55
Eric Sword type	952-4 (2)	16	1.1	60-120

Firstly, Table 3.2 shows above all that the data for Viking coinages have low measures of completeness of each sample as nearly all coin types have an n/do of below two, which creates for each coinage a wide range of die estimates. The Anglo-Saxon coin types, shown in Table 3.3, have higher n/d measures and, therefore, smaller ranges in the die estimates. This is not necessarily because of the fact that we are dealing with larger samples; for example, the Edward the Confessor's Expanding Cross type only has a sample of 81 coins, which is far fewer than the Swordless St Peter sample of 163 coins, yet the measure of completeness is 3.5 compared to the Swordless St Peter's 1.3. Merely having a small or large sample of coins is not the best indicator of a statistical rate of error. Table 3.2 shows that Viking coins were produced from as few as ten dies per year with the Sword St Peter coinage, and possibly up to 120 dies per year for Eric's Sword coinage. However, the latter type has an error rate of fifty per cent, which is very high indeed. The data for Rægnald's coin types, the Southern Sword types and the Triquetra/Standard type also contain huge variations in numbers and possible levels of error. It is perhaps more accurate to compare the Regal coinages with the Sword St Peter as they both have similar n/d measures. From this data, it would appear that the Regal coin type was larger than the Sword St Peter. This is to be expected as the Sword St Peter was one of several Sword types that were issued throughout the 920s, whereas the Regal type was the only coinage issued by the Viking kings of York at the time. These figures are interesting, but it is hard to understand whether this level of die production was normal for early medieval England without comparing the die output with contemporary or near contemporary Anglo-Saxon die estimates.

Table 3.3 Dies per year estimates for some other early medieval coinages for comparison with the Viking die estimates.⁶¹ Only a selection of the available data has been shown here, but can be seen in full in Appendix III.

Coinage type	Dates (years issued)	n	n/do	Do/t (Dies per year)
Saxon CC/CM types (all mints except York)	939-973 (34)	222	n/dr 1.5	Dr/t 7-12
Æthelred Crux (York)	c.991-997 (6)	330	2.9	23-9
Æthelred Long Cross (York)	c.997-1003 (6)	497	7.8	11-12
Æthelred Last Small Cross (York)	c.1009-17 (6)	463	5.0	12-15
Cnut Pointed Helmet (York)	1024-30 (6)	964	6.6	25-9
Cnut Short Cross (York)	c.1029-35/6 (6-7)	564	5.8	17-20
Edward Radiate Small Cross (York)	1044-6 (2)	112	3.4	35-46
Edward Expanding Cross Light (York)	1050-3 (3)	81	3.5	12-16
Henry II Tealby (York)	1158-89 (31)	105	4.8	1

Table 3.3 can be used to compare the die estimates for Viking, later Anglo-Saxon and English coin types. The mint is given as the die estimates both here and for the Viking types are only for one mint at a time; in the case of the Vikings, York was often the only mint and so the entire level of die production for the Viking kingdom can be estimated, but

⁶¹ The categorizations are based upon Blackburn, 'Currency under the Vikings, Part 2', 216. All Sword and other contemporary types here exclude the Vale of York data which has yet to be published in full. Appendix III gives full tables with all the die comparison data and references for the data, and includes all die estimates for the Good, Carter and Esty (but not Esty 2006) methods of calculation.

for the Anglo-Saxon types, there were several mints in operation at any one time. The estimates are again given as a range of dies used per year (Do/t). The completeness of the sample (n/d) is much higher for these Anglo-Saxon coin types and the ranges of die estimates are much smaller than the Viking coin types. But what does this data show about the volume of Viking currency?

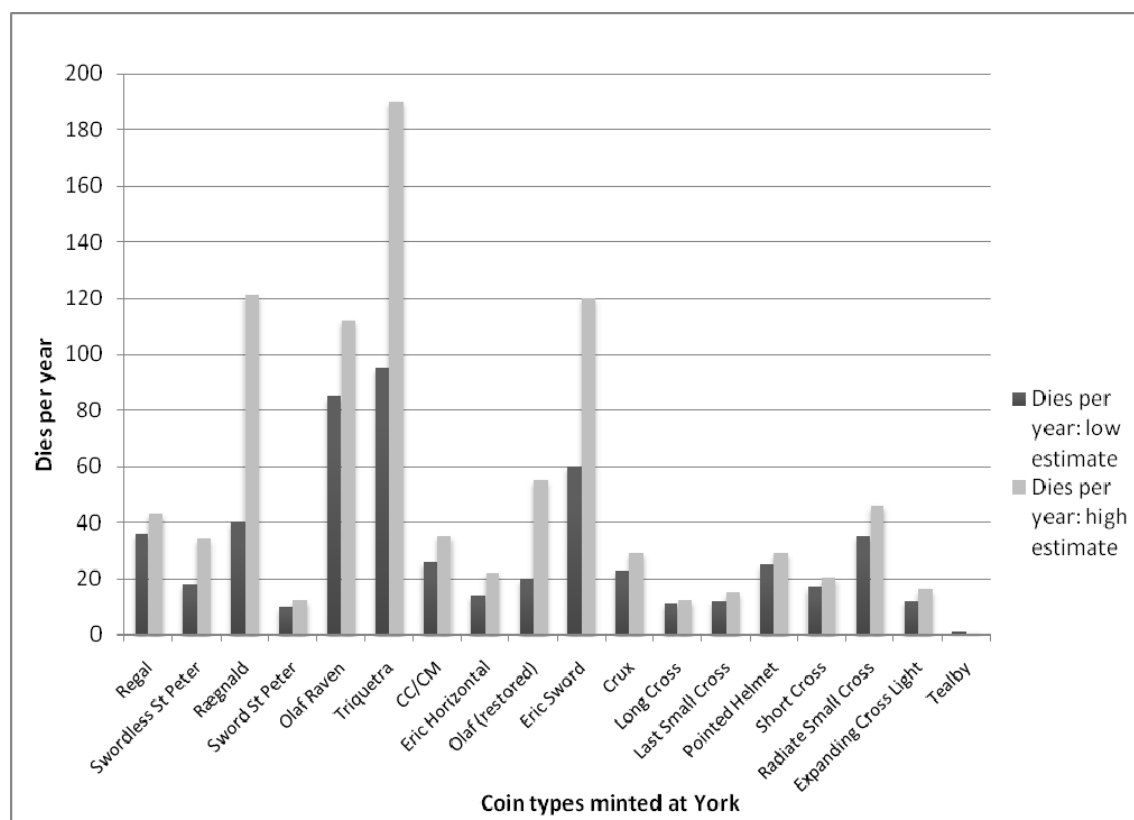


Figure 3.9 Graph showing the estimated dies per year used for Viking coin types minted at York (from Regal on the left to Eric Sword in the middle), and for a variety of tenth- and eleventh-century English coins, also minted at York (from Crux in the centre to Tealby on the right). The dark grey line shows the lowest estimate for dies per year, and the light grey the higher estimate. The bigger the difference between the two lines, the greater the error is likely to be in the data.

Figure 3.9 shows the estimated dies per year that were used to strike coins for various Viking, Anglo-Saxon and later English coins at York. The results reveal two things: firstly,

that the Viking estimates of dies per year have a very broad range as a result of the low sample size and n/d result, which indicates that the extant sample is a very small proportion of the dies that originally existed. Secondly, even discounting the wildly-varying results of the Rægnald, Raven Olaf and Eric Sword types, it shows that approximately the same number of dies were produced in Viking York as in later Anglo-Saxon York, when York was one of the major Anglo-Saxon mints. Since the die estimates are comparable, it is a safe assumption that the numbers of coins struck by those dies in the tenth and eleventh centuries were broadly comparable, even if we decline to put a figure to the number of coins produced by those dies. The die estimates for the Sword St Peter Viking coin type and Æthelred II's Long Cross type are remarkably similar, and the number of dies used for Henry II's Tealby coin type are very small compared to preceding Anglo-Saxon, English and Viking coin types. This indicates that the Viking mint of York was a serious mint, producing coins on the same scale as it was to do under the English kings from Æthelred II until at least the twelfth century.

This is a surprising result since it is known that during the late Anglo-Saxon period there was substantial output from mints, which was needed to fund the several Danegeld payments to the Viking raiders during Æthelred II's reign. Although there has been no attempt here to estimate the number of coins that were in circulation for the Viking period in York or for any of the Anglo-Saxon coin types, there are records of the costs of these payments made to the Vikings.⁶² This shows that there was a substantial volume of coins

⁶² The amounts of the Danegelds are debated in: M.K. Lawson, 'The Collection of Danegeld and Heregeld in the Reigns of Æthelred and Cnut', *English Historical Review*, 99 (1984), 721-38; J. Gillingham, 'The Most Precious Jewel in the English Crown': Levels of Denegeld and Heregeld in the Early Eleventh Century', *English Historical Review*, 104 (1989), 373-384; J. Gillingham, 'Chronicles and Coins as Evidence for Levels of Tribute

in circulation in late Anglo-Saxon England, which can be used as a basis for comparison. However, the large volume of currency in circulation in Anglo-Saxon England was produced by up to ninety mints, so it would be useful to know which of these mints had a comparable output to Viking York.⁶³ Unfortunately, very few complete die studies of Anglo-Saxon mints have been undertaken, but there are results available for York, Lincoln and Winchester, as discussed above. These have been studied because they are known to have been some of the larger mints in Anglo-Saxon England from the number of extant coin finds from them and also from the historical records. All three mints also continued making coins into the Norman period so there is scope for a comparison of die production over several centuries.

and Taxation in Late Tenth- and Early Eleventh-Century England', *English Historical Review*, 105 (1990), 939-950; M.K. Lawson, 'Danegeld and Heregeld Once More', *English Historical Review*, 105 (1990), 951-61; D.M. Metcalf, 'Large Danegelds in Relation to War and Kingship: Their Implications for Monetary History and Some Numismatic Evidence', in *Weapons and Warfare in Anglo-Saxon England*, ed. by S. Hawkes (Oxford: Oxford University Committee for Archaeology, 1989), pp.179-89.

⁶³ Mints shown on a map in Spink, *Coins of England*, p. 126.

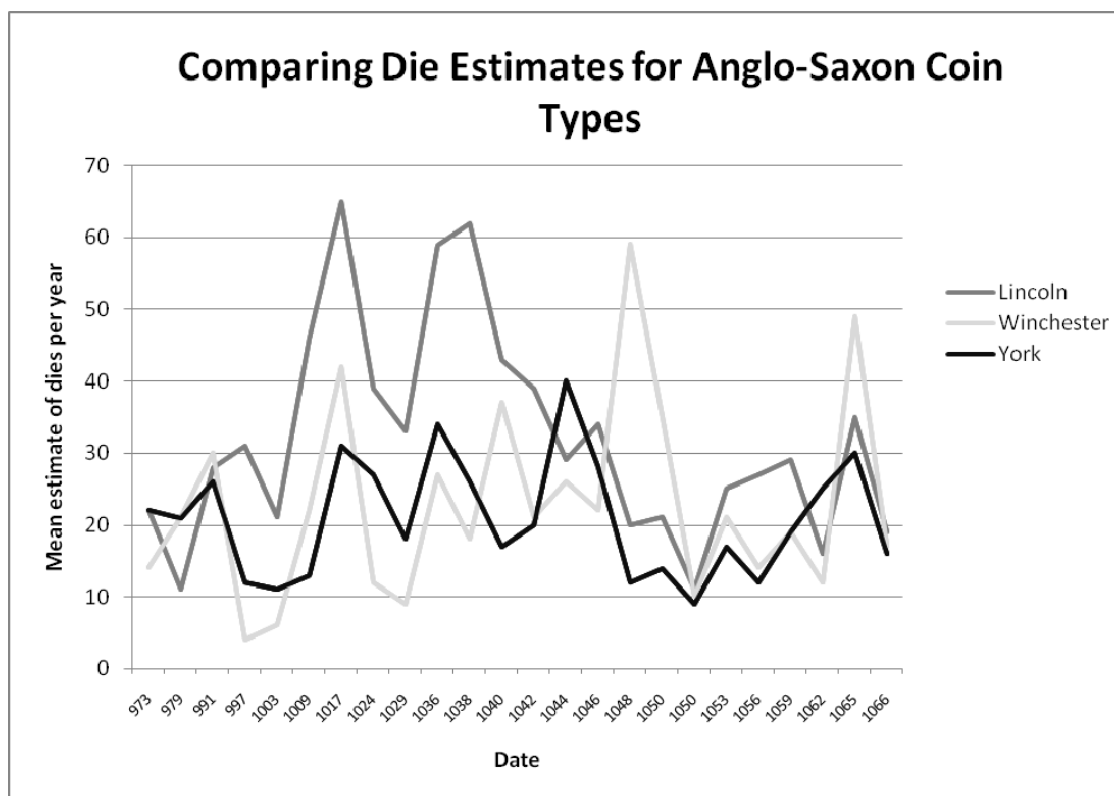


Figure 3.10 Graph showing the estimated dies per year used for Anglo-Saxon coins types from Edgar's Reform, c.973 to the Norman Conquest.⁶⁴ This shows the mean estimated number of obverse dies per year (Do) from three major Anglo-Saxon mints. During the issuing of some coin types, such as Edward the Confessor's Expanding Cross Heavy type (c.1050-3), all three mints seem to have used similar numbers of dies. In others, such as Harold I's Fleur de Lis type (1038-40), the Lincoln mint seems to have been using almost double the number of dies as Winchester and York. Across all mints there was an upward trend in die use (and therefore coin production) during the middle of Aethelred's reign, and a downward trend at the beginning of Edward the Confessor's reign.

So how far does the evidence of the York mint's coin production based on the evidence of the dies compare with other Anglo-Saxon mints? The coin types of various coins from three major Anglo-Saxon mints are compared in Figure 3.10. The mean number of dies

⁶⁴ The data was kindly supplied in advance of publication by C.S.S. Lyon and will shortly be available in 'Minting in Winchester', pp. 3-54.

per year is shown for each mint and although the numbers vary over time, from Edgar's reform of the coinage in c.973 to Harold II's Pax type in 1066, there are definite trends visible on the graph. The Lincoln mint is the most prolific mint for the late tenth and early eleventh centuries, after which date it is overtaken in production by York and Winchester, with a brief surge in die production in the 1050s. The production of dies at all three mints mirror each other, with growth in die production at the start and end of Cnut's reign, and another rise in production at the start of Edward's reign, first in York, then in Winchester. All three mints reduce production at the time of Edward's light and heavy Expanding Cross types in c.1053, and all again increased production at the end of Edward's reign in 1065-6. From this evidence it can be seen that the mint of York was not anomalous and generally followed the trends of other Anglo-Saxon mints in die production.

It can be concluded that the mints of Anglo-Saxon England produced enough coins both to pay several Danegeld payments and to sustain a functioning economy during the late tenth and early eleventh centuries. The die output from three major mints at this time shows that there was a rise in die production the early eleventh century, which may have been to cope with these payments, but that other factors, which are not historically documented, also caused general changes in the production and use of dies over the eleventh and twelfth centuries. This relates to the Viking kingdom of York in that it can be seen that the die production from the mint of York was not substantially lower during much of the Viking period than in the later Anglo-Saxon period and there is even some evidence, if subject to a high rate of error, that the die production could have been higher under the Vikings. From this evidence, it can be said that the Vikings in York produced several large coin types,

with enough coins produced to sustain a healthy economy, as the York mint did later in the tenth century. Importantly, the coins must have been produced in such numbers that the messages stamped upon them, which were designed with care and thought to legitimise the role of the Vikings in York, would have been seen by those using the coins, and this was not an insubstantial number of people.

Within the coin types of Viking York there is variation between the die estimates. Much of this variation may be to do with the small samples and the low measures of completeness in these samples, but there are some very interesting indications of the relative die production between different Viking rulers. It can be seen that the early Viking coins of Cnut, Siefred and Æthelwold (the Regal type) has a relatively high output and the estimate has a low error rate. The subsequent Swordless St Peter seems to show a drop in production, but it is unclear from the range of evidence just how drastic that drop may have been. The coins of Rægnald are so few and the error margin so wide that it is impossible to draw any sound conclusions from the evidence. With the Sword St Peter coins there is firmer evidence, which seems to show that there were fewer dies being produced than in the Swordless St Peter and Regal types, but this is also the first period where there is evidence of Viking coins being produced in mints other than York, and so the overall picture of die output from the kingdom of York probably shows less of a drop in die production. The data from the 940s and 950s show very high margins of error, and any conclusions must be considered very tentative. There is possibly an increase of production under Olaf Guthfrithson and Olaf Sihtricson, with the Raven and Triquetra/Standard being produced in larger quantities than the Anglo-Saxon-style Circumscription types and Two

Line types. There was possibly a rise in production under Eric's second coinage, but again, this is based on very difficult evidence. The evidence that is missing from this study is that of Æthelstan and his successor's coin types at York. Since no die study of Æthelstan's coins minted in York has yet been undertaken, this work may prove a fruitful area for future research and it would be very interesting to see how the Anglo-Saxon invasion of York affected the production of dies and coins in the city. As discussed in Chapter 2, there were fundamental changes in the coin design and standard weight of coins that were introduced by Æthelstan, so it would be interesting to know whether the Anglo-Saxons altered the fundamental die production and surrounding administration within the city. The higher post-939 rise in die estimates may indicate that there was rise in production under the Anglo-Saxon king, but the figures are still unclear.

Conclusion

In looking at the die production estimates over a long period, it is clear that die production was not something that increased evenly over time, but was something that responded to the wider economic needs of a kingdom, as well as its political circumstances. The need for payments such as the Danegeld led to increased production in major Anglo-Saxon mints of the late tenth and early eleventh centuries, but for many of the fluctuations in die production there is no documentary record of the cause. It is here that numismatics can go further than confirming the documentary sources, and be used to reveal new evidence of political and economic change within kingdoms.

Much of this chapter has been devoted to understanding the methodology of the die study and how to use the results from that exercise. This is because the results of a die study can be very tempting to use, but a sound knowledge of the theoretical bases of these methods, and how to assess the statistical reliability of the data, is vital if the data are to be used critically and to reveal patterns of coinage in the past, not just variations in data manipulation in the present.

This study of the volume of the currency in the Viking Kingdom of York has not given an estimate of coins that were produced under different kings during the history of the kingdom. Instead it has explored and used three sound statistical and numismatic methods to calculate and estimate how many dies were produced to create those coin types. The answers are unexpected in that the evidence shows that at least some of the coin types were produced in quantities comparable to the mint of York's die output under later Anglo-Saxon kings, such as Æthelred II. It must be remembered that the die output from York in the Viking period constitutes nearly all of that kingdom's coinage, whereas the output from York under later Anglo-Saxon rulers is only a proportion of that kingdom's coinage. Nevertheless, York supplied coins for most of the area north of the Humber both as a Viking and Anglo-Saxon mint.⁶⁵ There can be no doubt that the Vikings understood how to run a mint and did so with great skill, producing coins in enough quantities to function as a usable coinage for the kingdom.

⁶⁵ See below, Chapter 4.

Chapter 4

What was the Strength and Extent of Political Power in the Viking Kingdom of York?

In Chapter 3 it was shown that coins in York were produced on a large scale, comparable to that of major mints in later Anglo-Saxon England. These coins carried the carefully-crafted imagery which, as discussed in Chapter 2, was designed to legitimise the rule of the Viking kings in York by using symbols of religion, warfare and those which implied that the Vikings had a legitimate and royal lineage. It is with this in mind that this chapter will ask what happened to those coins once they had left the mint. The distribution of coin finds will be used to ask, firstly, whether the Vikings at York exerted strong political power over their kingdom, and, secondly, what was the geographical extent of this power? Finally, it will be asked whether the distribution of coins can be used to reveal levels of political power.

This chapter will examine the types of numismatic evidence that will be used, review the historical evidence for the Viking Kingdom, and then use this evidence to understand the strength of power the Vikings had over the city of York and the lands beyond.

The Documentary Evidence

The documentary evidence for the extent of the Viking Kingdom of York is not straightforward to interpret, consisting as it does of mainly annalistic evidence of battles between the Vikings and their Anglo-Saxon neighbours. The evidence from these historical sources is that the border between the Viking kingdom of York and the neighbouring Anglo-Saxon England was continually shifting, and the extent of the kingdom in 895 was radically different to that in 925 or 945. The Anglo-Saxon and Irish chroniclers only deemed certain events significant enough to record for posterity. These events included large battles, oaths of fealty, submission, or conversion, and peace or marriage-treaties, none of which were intended to serve as information on the geographical extent of the kingdom. Even when the picture of the extent of Viking York is pieced together from these sources, understanding the strength of political power held by the Viking kings is problematic. The chroniclers understandably emphasised the might of the Anglo-Saxon kings and the importance of their victories at the expense of the achievements of any Viking kings. Recent work has critiqued the notion of the existence of a Viking Kingdom of York at all, arguing that it is not a tenth-century, but rather a modern construct and label applied to the past which gives the rulers of York a higher status than they perhaps deserve.¹ The nomenclature may well be a modern convention as a convenient short-hand for describing the Viking Kings who ruled York and some other lands of which the geographical extent is either unknown or under current discussion, but it is a useful short-hand and will be used here.

¹ Williams, 'Conquest of the Northern Danelaw'; also see A. Woolf, *From Pictland to Alba 789-1070*, The New Edinburgh History of Scotland, 2 (Edinburgh: Edinburgh University Press, 2007), pp. 73-4.

There were many battles between the Vikings and Wessex, East Anglian, and Mercian kings during the first twenty years of Viking invasion during the peripatetic movements of the Great Army. The first indication of any kind of settled Viking Kingdom is from 876 when Halfdan settled in Northumbria and began to divide the land between his followers.² By c.895, Siefred was issuing coins bearing his name, the title of King, and the mint signature for the city of York. These two facts give an idea of a Viking kingdom centred at York and extending northwards from the Humber. The first major battle after that date is the battle of Tettenhall in 910.³ The raids of 909 by Edward the Elder and his forces appear to have been the trigger for the Viking retaliation which led to Tettenhall.⁴ The Vikings lost heavily in this battle, with the *Anglo-Saxon Chronicle* recording that thousands perished, and naming two kings, two jarls and two holds who were slain. Tettenhall lies near Wolverhampton, and it is unclear why the battle occurred in this location; whether it was because Tettenhall lay on the border between Mercia and the Viking Kingdom, or whether this was a bold incursion by the Vikings into Edward's lands. The Viking King Rægnald is said to have fought with King Constantine of the Scots in 914 or 918 at the Battle of Corbridge.⁵ The date of this battle is uncertain, and there has been much debate on whether there was in fact one battle and whether the second is merely the product of misguided reliance upon the *Historia de Sancto Cuthberto*; the battle has been discussed earlier in Chapter 2.⁶ The location of Corbridge on the banks of the Tyne, and the battle against the enemies, the Scots and the Earls of Bamburgh, would perhaps indicate a northern border for the Kingdom of York in the 910s.

² ASC, A, E, s.a. 876 [877]; Rollason, *Sources for York History*, p. 63-4.

³ ASC, C, E, s.a. 910, ASC, D, s.a. 911 [910] ; HR I, s.a. 910; HR II, s.a. 911 [910].

⁴ ASC, C, D, E, s.a. 911 [910], 912 [911]; HR I, s.a. 911, 912; HR II, s.a. 910.

⁵ HSC, §22, §24, AU, s.a. 918 §4.

⁶ Wainwright, 'Battles at Corbridge', 156-73; Downham, *Viking Kings of Britain and Ireland*, p. 93; Johnson South, HSC, p. 159; Rollason, *Sources for York History*, p. 66; see Chapter 2, pp. 72-3.

Therefore, what Corbridge may demonstrate is that the northern border of the kingdom was the river Tyne, beyond which the land was held by the Community of St Cuthbert.⁷

Other records of events in the annals are equally unclear about the extent of the Viking lands. Meetings at such as the one at Tamworth in 925 between Viking and Anglo-Saxon kings could be interpreted in two ways.⁸ Either meetings took place on the borders between these two kingdoms showing that both were equally powerful at this point, or they were held well-within Anglo-Saxon territory and represent the weakness of the Vikings' position.⁹ The meeting at Eamont Bridge in 926 between Æthelstan and the kings of the West Welsh, Gwent, Scots and Wenti could have similar interpretations. Are these meetings of peace and submission signs of Anglo-Saxon weakness or of strength? Can they really tell us anything about the borders of kingdoms?¹⁰

Records of the programme of fort-building instigated by Æthelflæd and Edward give a glimmer of hope for the historian attempting to understand the extent of the Anglo-Saxon kingdom in the early tenth century. The forts and dates of their construction or repair are shown below in map 4.1. The earlier fortifications such as Bromesberrow in 910, Witham, Bridgnorth and Hertford, fortified in 912, as well as Stafford and Tamworth in 913, form a belt across England which is south of Watling Street for much of its length. Later forts such as Rhyddlan in 921, Thelwall and Manchester in 919, Nottingham and Stamford in 918 form

⁷ Rollason, *Northumbria*, pp. 274-5.

⁸ *ASC*, A, F, s.a. 924 [920]; *ASC*, D, s.a. 925.

⁹ Rollason, *Northumbria*, p. 262.

¹⁰ *ASC*, D, s.a. 926; *HR II*, s.a. 926.

a slightly more northerly line, perhaps indicating some movement by the Anglo-Saxons into previously Viking-held territory.

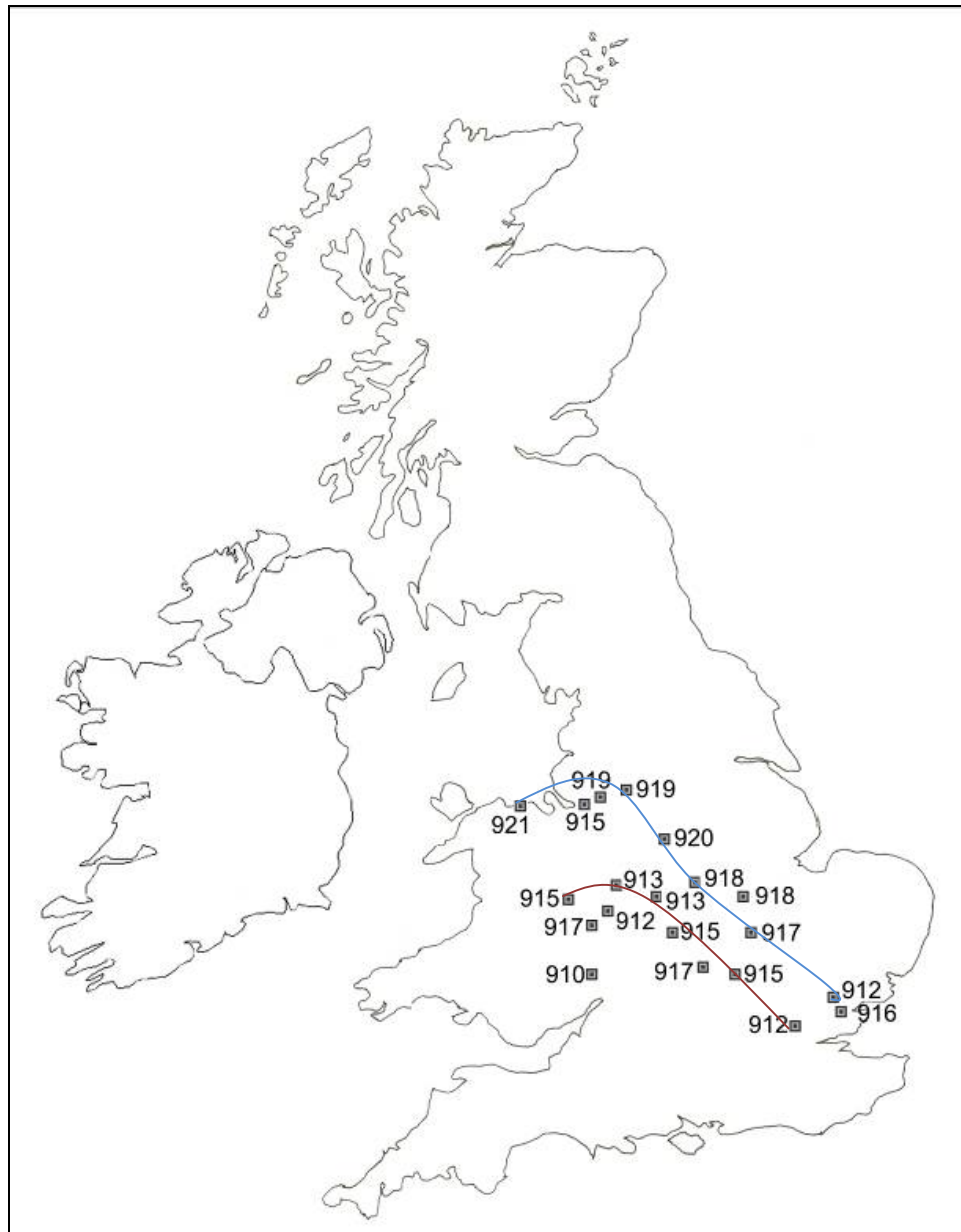


Figure 4.1 The location of Anglo-Saxon forts or burhs and the date in which they were fortified by Edward or Æthelflæd. The red line joins many of the earlier forts and the blue line joins many of the later forts

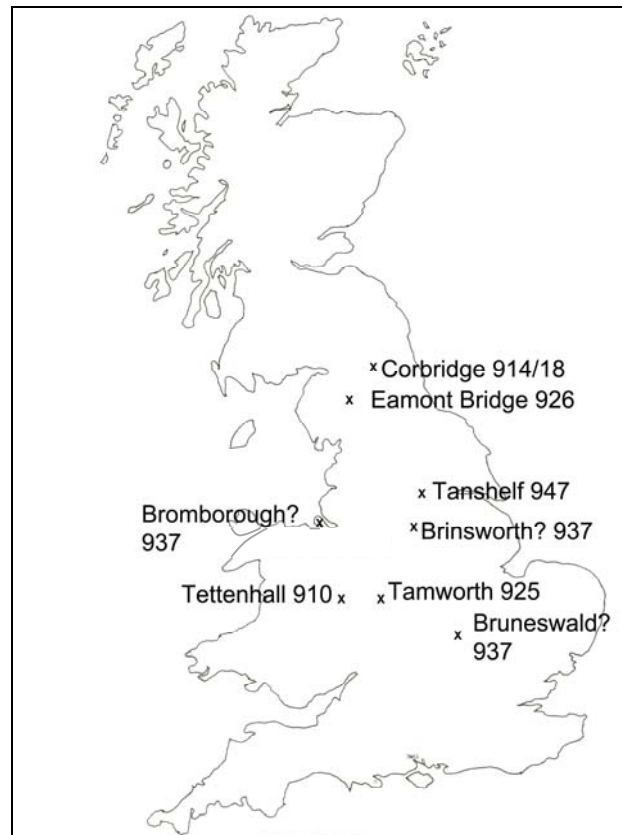


Figure 4.2 Map showing locations of meeting places and the dates of those meetings between Vikings and Anglo-Saxons in the tenth century. Bromborough, Brinsworth and Bruneswald are all shown as they are possible locations for the Battle of Brunanburh in 937.

It is with Æthelstan's victory and capture of York in 927 that there seems to be some solid evidence about the Viking Kingdom, centred on York. The famous Battle of Brunanburh in 937, however, is once again problematic.¹¹ Although the battle was documented widely, the location of the mysterious Brunanburh is unknown. Several contenders for the location have been mooted, such as Bromborough in Cheshire, Brinsworth near the Humber, or

¹¹ The poem, *The Battle of Brunanburh* appears in *ASC*, *A*, *B*, *C*, *D*, s.a. 937, but the battle is referenced in a short annal in *E*, *F*, s.a. 937; *HR I*, *HR II*, s.a. 937; *AU* s.a. 937.

Bruneswald, near Bedford, all of which are shown in Figure 4.2 above.¹² The first two towns both sit on what could conceivably been the border of the Viking Kingdom of York, with Bruneswald lying in what could have been Æthelstan's kingdom, or the border between his lands and the Danelaw. It is tempting to ponder whether Æthelstan was on the offensive or defensive when he met the Vikings in battle, and to assign a location for Brunanburh depending on what one would like the theory to be, or to choose a town and then decide upon Æthelstan's motive, but neither approach is methodologically sound. Again the documentary evidence is tantalisingly specific in terms of locations and dates, but unspecific about what the location meant in terms of kingdoms and the political power of the parties involved in the battle.

The *Capture of the Five Boroughs*, is a poem which was inserted into the *Anglo-Saxon Chronicle*, which celebrates Edmund's victory against the Vikings in 942.¹³ The interesting point about this poem, which is in the same tradition, but on a smaller scale than the *Brunanburh* poem, is that the *Anglo-Saxon Chronicle* and other sources omit to mention, quite understandably, the Viking victory that presumably occurred before this battle which necessitated the recapture of the Five Boroughs by Edmund.¹⁴ The poem, uncharacteristically for the textual evidence, gives some geographical boundaries for the land Edmund regained: the Dore, Whitwell Gap and the Humber River.¹⁵

¹² Bromborough: J. McN. Dodgson, 'The Background of Brunanburh', *Saga-Book of the Viking Society*, 14 (1957), 303; Brinsworth: N.J. Higham, 'The Context of Brunanburh', in *Names, Places and People: An Onomastic Miscellany in Memory of John McNeal Dodgson*, ed. by A.R. Rumble and A.D. Mills (Publisher: Stamford, 1997), p. 155; Bruneswald: M. Wood, 'Brunanburh Revisited', *Saga-Book of the Viking Society for Northern Research*, 20 (1980), 212.

¹³ ASC, A, s.a. 942.

¹⁴ Rollason, *Northumbria*, p. 264.

¹⁵ ASC, A, s.a. 942.

After Edmund had lost the Five Boroughs once again after the 942 victory, his successor Eadred attempted to establish his authority over those lands in Tanshelf, near Pontefract, in 947. This appears to have been a meeting between the king and the counsellors of York and Archbishop Wulfstan, in which they pledged their allegiance to the Anglo-Saxon king.¹⁶ However, like many such pledges, this one was broken and the Northumbrians evidently invited Eric Bloodaxe to rule their city, which prompted swift retaliation from Eadred in 948.¹⁷ The chronology for the late 940s has been debated in recent years and is discussed in Chapter 2, however here the conventional dating has been used.¹⁸ The final chapter in the history of the Viking kings of York is the death of Eric who was expelled from York in 954. According to Roger of Wendover, he was killed whilst fleeing across Stainmore having been betrayed by the Earl of Bamburgh.¹⁹ The location of his death in Stainmore, which is a pass over the Pennines, has been interpreted as showing that this was the route by which Eric was fleeing from York to his other lands in the Scottish Islands, and that it was therefore a route to and from York.²⁰

The advantages of the textual evidence are the chronological precision given to events and places, which has been used to give some idea of the contracting and expanding border of the Viking kingdom throughout its history.²¹ Yet, given the omission of the loss of the Five Boroughs before the recapture by Edmund in 942, it is plain that the whole story is not to be found in these sources. The documentary evidence gives indications of the disputed areas

¹⁶ *ASC, D*, s.a. 947; *HR I*, s.a. 949.

¹⁷ *ASC, D*, s.a. 948; *HR I*, s.a. 950.

¹⁸ S. Keynes, 'England, c.900-1016', pp. 472-3.

¹⁹ *FH*, pp. 402-3.

²⁰ Smyth, *Scandinavian York and Dublin II*, p. 183; Downham, *Viking Kings of Britain and Ireland*, p. 120.

²¹ Smyth, *Scandinavian York and Dublin II*, pp. 1-190.

between Viking York and the Anglo-Saxon kings, but all too often the locations of peace meetings, treaties and battles can and have been interpreted according to opposing theories; either these locations have been used to prove Anglo-Saxon strength or its weaknesses. So it is useful to ask whether the numismatic evidence can provide any answers on not only where the Viking Kingdom of York may have extended to, but also how powerful that kingdom was in the areas it covered. These questions can be answered by looking at the distribution of coin-finds in Northumbria and the rest of Britain in the period in which the Vikings were active. The evidence of hoards and single coin finds will therefore be studied, firstly, to see how reliably this evidence can be used in historical enquiry, and, secondly, to see whether it can shed any light on the extent of the Viking Kingdom of York and the political strength of the kings who ruled it.

Understanding the Evidence: Hoards and Single Finds

These are two distinct types of evidence that have been used to clarify different aspects of medieval (and earlier) money: hoards and single finds. These forms of evidence have generally been used by numismatists and historians to date coin types and to understand how money was used. The latter topic will be discussed in Chapter 5, but the focus of this chapter is using hoards to investigate the extent of the political power of the Viking kings. A hoard is defined as a group of coins which were buried together and can number from two coins to tens of thousands. Evidence from hoards has been discussed frequently in the numismatic literature, and has been divided into several categories according to scholars' perceptions of

the motivation for the deposition of particular hoards.²² The deposition of a hoard could be the result of many types of activity, from the loss of a purse, to a deliberate burial of savings or a ritual payment. Much has been made in the numismatic literature of the difference between ‘emergency’ and ‘savings’ hoards, yet the motives for deposition and the intended recovery of a particular hoard are difficult to ascertain from the evidence of the group of coins in them.

A savings hoard, it is argued, is a hoard which has been built up slowly and systematically over a period of time, and so is represented by a range of coins over time, seen in the different coin types or monarchs present in the sample.²³ In such hoards, one would expect older coins to be at the base of the vessel in which it was contained, and newer coins at the top. In medieval England, it was common for coin types to be replaced with a new design, either because of a new king or to generate some income for the mint. In late Anglo-Saxon England, it is argued that this developed into a strict system of recoinages which were instituted every six years from the reign of Edgar onwards.²⁴ Each recoinage effectively demonetised the previous coin type which meant that it was no longer legal tender. However, because the value of a coin was in its silver content, old coin types could be hoarded and exchanged for the new coin type when they were needed, rather than changing all one’s wealth at every type change. This would explain why it is common for older coin types to be present in coin hoards, as these coins accumulated over the years, even if not in circulation at the time of recovery from the hoard, could still have been melted down and

²² P. Grierson, *Numismatics* (Oxford: Oxford University Press, 1975), p. 130.

²³ *Ibid.*, p. 135.

²⁴ R.H.M. Dolley and D.M. Metcalf, ‘The Reform of the English Coinage under Edgar’, in *Anglo-Saxon Coins: Studies Presented to F.M. Stenton on the Occasion of his 80th Birthday*, ed. by R.H.M. Dolley (London: Methuen, 1961), p. 152.

struck into the new coinage. Analysis of the physical arrangement of coins within hoards has, however, not been available for most hoards, as they were dispersed before such details were recorded by the antiquarians or metal detectorists who discovered them.

It is also assumed that a savings hoard would comprise the finer specimens of coins in circulation at any time for two reasons: firstly, that they might be worth more, and, secondly, because they looked more attractive.²⁵ Since the value of a medieval coin was in its metal content, high denomination coins were more likely to be buried than low denomination, and new coins more likely to be buried than coins which had been in circulation and had some surface metal and value rubbed away through use. Coins which had been circulated less, and were less worn were more likely to be saved in a hoard than an old damaged, chipped or broken example. There is an opinion amongst numismatists, that people in the past hoarded coins rather like the coin collector does today, by eschewing broken and defective specimens in favour of rarer coins with unusual designs.²⁶ The definition of a savings hoard as opposed to an emergency hoard, has therefore been distorted by the assumption that hoarding was the same as coin collecting.

An emergency hoard, by contrast is defined as one which was hurriedly buried or indeed lost, and contains coins and objects contemporary to each other and available within the immediate vicinity. Emergency hoards are considered to be of a more haphazard composition, and were selected quickly in the face of imminent attack or natural disaster and buried quickly in the hope of recovery when the danger had subsided. However, the

²⁵ Grierson, *Numismatics*, pp. 135-6.

²⁶ *Ibid.*, p. 135.

distinction between a savings and emergency hoard is not clear cut. Someone may have bought coins direct from the mint and buried them immediately, or a hoard may have been collected over years but hurriedly buried in a new location in a time of strife. Moreover, some assumptions about such hoards have proved misleading.

The desire to categorise hoards has led to some erroneous assumptions about early medieval hoards. For example the Cuerdale hoard was for many years categorised as an emergency hoard, thought to have been buried directly after the Battle of Tettenhall in 910 by routed Vikings running away from the conflict and in a hurry to bury their treasure in the aftermath of the battle.²⁷ However, recent analysis has dated the hoard approximately five to seven years earlier than the battle, meaning that the hoard may well have been buried in a hurry, but it would have been after some skirmish unnamed in the documentary sources.²⁸

A third category of hoarding, the ritual hoard, is similarly difficult to define. The features of such a hoard are said to be burial near important natural landmarks, for purposes of making a sacrifice to divine powers associated with them.²⁹ But such hoards could equally have been buried near landmarks so that the owner would remember where they had buried their wealth, and need have had nothing to do with ritual activity. This category will therefore not be considered in what follows.

²⁷ P. Nelson, 'The St Peter Coins of York', *Numismatic Chronicle* (1949), 116.

²⁸ Williams, 'Cuerdale Coins', p. 62.

²⁹ J. Graham-Campbell and J. Sheehan, 'Viking Age Gold and Silver from Irish Crannogs and Other Watery Places', *Journal of Irish Archaeology*, 18 (2009), pp. 88-9.

The problem of defining the intentions behind the deposition of hoards is all but impossible to solve, unless clues are found during the recovery of the hoard from the ground. Unfortunately, many Viking and Anglo-Saxon hoards were discovered centuries ago and any such clues have been lost. Even today, the use of heavy agricultural machinery and years of ploughing have disturbed many archaeological contexts, such as the vessel the coins were contained in, with even newly discovered complete hoards being scattered under the surface of the ground as a result of these agricultural practices.³⁰ Furthermore, the recovery of hoards by metal detector enthusiasts often, but not always, destroys the surrounding archaeological context, and any information surrounding the deposit which may have been of use for interpreting the reasons behind its deposition. Excavation within the hoard vessel has been possible with some recent hoards reported through the Portable Antiquities Scheme, such as the Vale of York hoard and the Frome hoard.³¹ The former hoard was buried in an ornate silver-gilt vessel, and coins and objects in the hoard were excavated in 1cm layers. Since there seemed to be no order in the deposition of the objects that would indicate deposition occurred over a long time, it is clear that in this case at least we have evidence for the hoard being an emergency hoard.³²

If the intentions behind the burial of hoards are in most cases unknown or unknowable, does this affect how hoards can be used and understood in historical interpretation? The distinction between a savings hoard and an emergency hoard may be a useful one for

³⁰ Moesgaard, 'Single Finds as Evidence', p. 244.

³¹ Ager and Williams, *Vale of York Hoard*, pp. 8-13; S. Moorhead, A. Booth and R. Bland, *The Frome Hoard* (London: British Museum Press, 2011), pp. 6-11.

³² B. Ager, 'A Preliminary Note on the Artefacts from the Vale of York Viking Hoard', in *Studies in Early Medieval Coinage*, II, ed. by T. Abramson (Woodbridge: Boydell & Brewer, 2011), p. 122.

understanding the motives of individuals who buried their coins, but is it relevant to the wider discussion of political power?

The composition of hoards has been used to great effect in understanding the chronology of the Viking Kingdom of York. An example of using hoards to refine chronology can be seen in the ‘Sword’ type coin of Eric Bloodaxe. This coinage was long thought to have been produced at the same time as the similar Sword types of Sihtric, St Peter and St Martin. This led to a confusing chronology as Sihtric’s reign was dated to the 920s by the *Anglo-Saxon Chronicle*, and it was assumed that the Sword coinages either belonged to a later period and that it was Sihtric II who issued this type, or that Eric Bloodaxe reigned earlier than the dates attested in the *Anglo-Saxon Chronicle* and other sources.³³ By looking at the distribution of Viking coin types, it can be seen that the Sword types of Eric do not appear in hoards which contain the earlier Sword types. So Eric’s reign and coinage was dated to the 940s and 950s, and it was assumed that Eric’s design harked back to the earlier coin types.³⁴

³³ Rashleigh, ‘Remarks on the Coins of Northumberland’, pp. 88-100; *ASC*, *D*, s.a. 948, *D E*, 954.

³⁴ Notably in Dolley, ‘Post-Brunanburh Coinage of York’, pp. 40-3.

Table 4.1 Showing how hoards can be used to refine the chronology of undated coin types. The two Viking types are shown: the Sword types (including St Peter, St Martin, Sihtric, Anonymous and Rorivacast varieties) and Eric's types (Sword and Two-Line Horizontal). When the presence of Anglo-Saxon coins in hoards is compared, it is clear that the coins of Eric appear in hoards with generally later Anglo-Saxon coins than the Swords. This leads to the conclusion that the Eric coins are not related to the Sword coinages, and that they were produced much later.

Hoard	Coin types									
	920s Swords	Eric	Alfred	Edward	Æthelstan	Edmund	Eadred	Eadwig	Edgar	Athelred II
Bangor	5			3						
Morley St Peter	2		80	762	1					
Vale of York	25		51	402	105					
Glasnevin	1			14	13					
Claremont	4				2					
Portree	2			33	62					
Killyon		1		7	24	22	22			
Lough Lene		1			4	3	7	4	1	
Tetney		1					47	69	285	
Iona		2			8	14	64	26	98	6

Hoards have been used to try to understand the intentions of those who buried them, and to refine the chronology of kings and coin types, but can they be used to understand the wider political context of the time in which they were buried? Even if it can never be known whether a hoard was buried as part of long-term savings, or in a more hurried manner in an emergency, the burial of groups of coins says something about the coins people in a particular location had access to, and the coins they may have used. The presence of hoards, taken in conjunction with single finds of coins, can be used to understand which coin types were in circulation at the time of deposition. In view of this, the tenth-century hoards

examined in this chapter will not be categorised, but studied individually, with the compositions and details of burial and recovery available in the gazetteer of hoards in Appendix IV. It is with the distribution of single finds, that hoard distribution can begin to provide useful information about where coins were used and buried.

Single finds are coins which were uncovered singly during archaeological excavations or by metal detector users. They are generally interpreted as more representative of currency in circulation as their loss was accidental and occurred during the daily course of life and commerce. Of course, a penny in the tenth century was still something of high value and no denomination was so small that loss was not a matter of concern.³⁵ A dropped coin would most likely have been searched for, and in many cases recovered; it is the ones which got away that form the corpus of modern-day single finds. If single finds are objects that were lost by accident, we might theorise that high densities of them represent areas of high population such as cities, and especially the commercial centres within these, such as markets. Of course, there may have been seasonal and moving trading centres with no resident population where coins were also lost. Places where high numbers of people were regularly handling large numbers of coins would be places with an increased chance of coin-loss. By contrast we might expect rural areas away from the commercial and residential centres to have less likelihood of coin-loss due to fewer coin transactions taking place.

Single-find analysis is a relatively new tool for the numismatist. Early numismatic work focused upon hoards as this was the context in which the majority of new coins were found,

³⁵ Rigold, S.E., 'Change in the Light of Medieval Site Finds', in *Edwardian Monetary Affairs*, British Archaeological Reports, British series, 36, ed. by N.J. Mayhew (Oxford: BAR, 1977), p. 59.

and found in generally better condition.³⁶ The rise in metal detecting as a hobby has meant a huge increase in coin finds over the last forty years. At present the Portable Antiquities Scheme is a national scheme for England in which all metal-detector finds can be registered. The Fitzwilliam Museums Corpus of Early Medieval Coin finds is also a register for recent coin-finds, incorporating the function of the *British Numismatic Journal*'s Coin Register. The value of the Early Medieval Corpus lies in the advanced search functions for coin types and the inclusion of data from the *Sylloge of Coins from the British Isles* series for comparison of material.

The increased and increasing number of coin finds offers great potential for numismatic, archaeological, and historical research. Single finds attract the attention of scholars because they are perceived to be, unlike hoards, a random sample of coins which were in use at the time they were deposited. However, it is important to remember that single finds may be of coins which were randomly lost, but the ones discovered in the present day are not representative of the number of coins in circulation in the past.³⁷ Although the data for single finds has increased greatly over the last forty years, it must be remembered that, although theoretically the single-find evidence constitutes a random sample, it is in fact not random. The Portable Antiquities Scheme is staffed by Finds Liaison Officers and, although generally very good, the quality and quantity of single finds varies according to the relationships between an individual officer and the local metal detecting community, as well as the popularity of metal detecting in a particular area. This varies according to soil type, land access, friendliness of landowners, density of population, and rumours circulating of

³⁶ Dolley used hoards extensively in his 'Post-Brunanburh Coinage' and in Dolley and Metcalf, 'The Reform of the English Coinage under Edgar'.

³⁷ Rigold, 'Medieval Site Finds', p. 59.

good prospects for finding coins and other metal objects. So, although single finds of coins are more random and representative of the coins which were in use when they were lost than are hoards, they do not constitute a random sample. So, for example, a higher proportion of Anglo-Saxon coins found than Viking coins may indicate that there were more Anglo-Saxon coins in circulation, but the proportions between the two will not prove this.

Single coins are also found during archaeological excavations and their deposits in such contexts may have been the result of accidental loss; but more can sometimes be discovered about the circumstances of loss as the archaeological context is recorded during their recovery, by contrast to many metal-detector finds where context is lost during recovery of the object. This means that archaeologists, with single finds as with hoards, may be able to interpret more about the deposition. Factors influencing the distribution of single finds made during excavations include the highly selective way in which sites are chosen for archaeological investigation. Excavation sites are not a representative sample, and even in comparing excavations in urban centres, such as York, Dublin and Chester, it must be remembered that varying percentages of these cities have been excavated, so comparison between coin finds on individual sites is not statistically viable.³⁸

The evidence for where coins were used comes from hoards and single coin finds, with hoards being more likely to represent the coins in circulation over time, and single finds to represent coins currently in circulation when they were lost. Many numismatists have tried to understand the intentions behind hoarding by categorising hoards as savings or emergency

³⁸ Rigold, 'Medieval Site-Finds', pp. 59-79.

hoards. In this thesis, this approach is disregarded as liable to misinterpretation; instead the patterns of both hoards and single finds will be examined together.

The Distribution of Viking-Age Coins

Having looked at the methodological issues surrounding the nature of the evidence it is time to look at the pattern of the evidence of hoards and single finds for the tenth century and what this can reveal about the nature and extent of Viking political power. Elsewhere, distribution maps of coin finds and hoards have been used to discover the extent of a kingdom by examining how far coins minted in a kingdom travelled before their deposition.³⁹ This method is useful in cases in which it is known where a coin type was minted, and the distribution of single finds especially, as the result of commercial transactions, has been used to map the extent of a kingdom. This approach was criticised by Grierson who highlighted the fact that means other than economic exchange of coins could have caused to move within and between kingdoms, so that these movements need not have reflected the extent of the economic reach of the issuing authority.⁴⁰ However, Grierson's critique was based largely on numismatic methodologies, themselves based on the distribution of hoards, and the recent growth in single find evidence means that many of his arguments are not applicable. In any case, the aim of this chapter is not to map just the economic sphere of influence of the Viking kingdom, but also the political one. The movement of Viking coins may reflect the exchange of goods for money, or of political gifts

³⁹ J. Graham-Campbell, 'The Northern Hoards: From Cuerdale to Bossall/Flaxton', in *Edward the Elder, 899-924*, ed. by N. Higham and D.H. Hill (London: Routledge, 2001), pp. 212-13; D.M. Metcalf, *An Atlas of Anglo-Saxon and Norman Coin Finds, c.973-1086* (London: Royal Numismatic Society Special Publications, 1998).

⁴⁰ P. Grierson, 'Commerce in the Dark Ages: A Critique of the Evidence', *Transactions of the Royal Historical Society*, 5th ser., 9 (1959), 129-39.

or payments, but the presence of coins still reflects, to some extent, the geographical areas in which it these coins were acceptable as any kind of payment or gift.

The distribution of coins has also been used to understand the strength of political power more directly. It has been argued, for example, that the lack of single finds of foreign coins in the Carolingian kingdom reflects the fact that the Carolingian kings had a firm control of their economy and could effectively exclude all foreign currency from circulation in their lands.⁴¹ This image of Carolingian political strength over the economy is gleaned from the numerous edicts and documented evidence of recoinages, such as the Edict of Pîtres in 864 which decreed that a new coin type should be issued for Charles the Bald to be legal tender, named official mints, and stipulated punishments for false coining.⁴² This documentary picture, combined with a lack of foreign coins found in Carolingian hoards has led to the widely-accepted notion that Carolingian political power was such that all foreign coins could be excluded from the Carolingian lands. The profitability of minting coins meant that any such monopoly of coin use would have been financially favourable to kings who could enforce it. There are some possible problems with this theory. Firstly, the theory is based mainly upon hoard evidence and since metal detecting is illegal in France, a comparable body of evidence to the Portable Antiquities Scheme and *Early Medieval Corpus* has not been discovered or recorded for much of the Carolingian kingdoms. Secondly, the proclamations in the documentary evidence relating to coin changes and laws do not necessarily reflect the patterns of coin types and practices which existed. For example, in

⁴¹ S. Coupland, 'Money and Coinage under Louis the Pious', in *Carolingian Coinage and the Vikings: Studies on Power and Trade in the Ninth Century* (Aldershot: Ashgate, 2007), p. 25.

⁴² P. Grierson, 'The Gratia Dei Rex Coinage of Charles the Bald', in *Charles the Bald: Court and Kingdom, Papers Based on a Colloquium Held in London in April 1979*, British Archaeological Reports, International series, 101, ed. by M.T. Gibson and J.L. Nelson (Oxford: BAR, 1981), pp. 41-2.

later medieval England, laws which banned the export of silver and English coin, and a ban on the use of foreign coins were repeatedly promulgated from 1284 to 1393.⁴³ This does not indicate a high level of control over the export of coin and what constituted legal tender, but rather the opposite: the laws were issued repeatedly precisely because they were not being adhered to.

It is with these discussions on the extent and strength of political power that the distributions of coins in tenth-century England will be examined with regard to the extent of the power of the Viking Kingdom of York. In the survey which follows, the findspots of all hoards and single finds from c.895 to c.975 have been recorded and mapped, as well as those of all later hoards which contain coins minted in the Viking Kingdom of York. This is from the approximate date of the first Viking coinages of York until the reform of Edgar's coinage in c.973-5.⁴⁴ The latter date was chosen as there are many hoards of Viking York coins which post-date the Anglo-Saxon conquest of York in 954, and the major numismatic event, a full recoinage throughout England, is a convenient end point for the survey.⁴⁵ This period will be referred to as the Viking Age in this chapter. The data will be presented on a plain outline map for clarity. Ireland is excluded from maps of single-find evidence, because metal detecting is illegal in the Republic of Ireland and there is no published source of single find data for the country.

⁴³ Craig, *The Mint*, pp. 54-81.

⁴⁴ Blackburn, 'Currency under the Vikings, Part 2', p. 205; Dolley and Metcalf, 'Reform of the English Coinage under Edgar', p. 152.

⁴⁵ Dolley and Metcalf, 'Reform of the English Coinage under Edgar', p. 152.

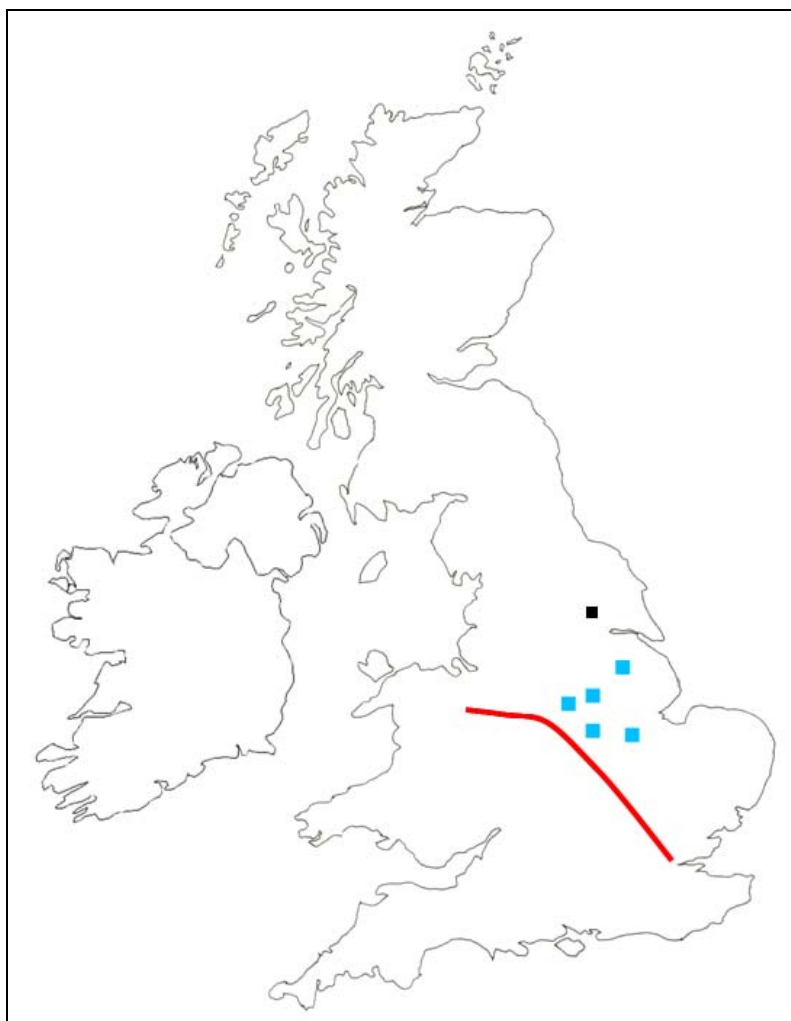


Figure 4.3 Map of Britain and Ireland showing the Five Boroughs, York and Watling Street. York is marked with a black square. The Five Boroughs of Lincoln, Stamford, Nottingham, Derby and Leicester are marked with blue squares, and Watling Street with a red line. Watling Street is shown here as a useful geographical marker rather than a fixed border.

For the discussion below, the hoards and single finds of all coins have been included and divided into several categories: the Viking coins are split into those made in the Northern Danelaw, which covers coins produced in York or the Five Boroughs, and the Southern Danelaw containing coin types produced in East Anglia. Coins of the kings of England, and the preceding Anglo-Saxon kingdoms such as Mercia, East Anglia and Wessex are included

as one group with the archiepiscopal issues of Canterbury from the late ninth century. Coins produced in the Carolingian kingdoms are shown, as are coins produced under Islamic dynasties. The hoards of the Viking Age also contain a few coins which were made in other areas such as Denmark and Normandy, which are listed in the gazetteer of hoards in Appendix IV but not shown on the distribution maps due to their small number. Further details about the ruler who issued the coins are also given in the gazetteer. The hoards detailed here are those from England, Scotland, Wales, and Ireland from the Viking Age. There are a few single finds from beyond England, but the illegality of metal-detecting in Scotland, Ireland, Sweden and France means that there is no comparable map of single finds for these regions. Metal-detecting is legal in Denmark, but there is no central collection of data comparable to the Portable Antiquities Scheme. The gazetteer also contains further information about the composition of each hoard, the circumstances of its burial and recovery and the presence of associated finds such as a container for the hoard, where this information is available.

The overall impression of the level of data for the Viking age is shown below in Figures 4.4 and 4.5, with hoards represented by squares and single finds by dots. A quick glance will show that the single find data, mainly gathered in the last forty years, is an enormous resource, and one which was not available to earlier numismatists of the Viking and other tenth-century coinages. The overall pattern in Figure 4.4 shows that hoards are more common in Ireland, the West coasts of England and Scotland and in northern England, than in Southern England. Does the presence of hoards in these areas reflect a different pattern of behaviour in terms of saving money; does it show that hoarding was more common in areas

which were subject to wars and battles such as Ireland or the Northern Danelaw? Or does this pattern reflect something else, perhaps higher levels of metal-detecting or archaeological excavations leading to increased numbers of hoards being discovered?

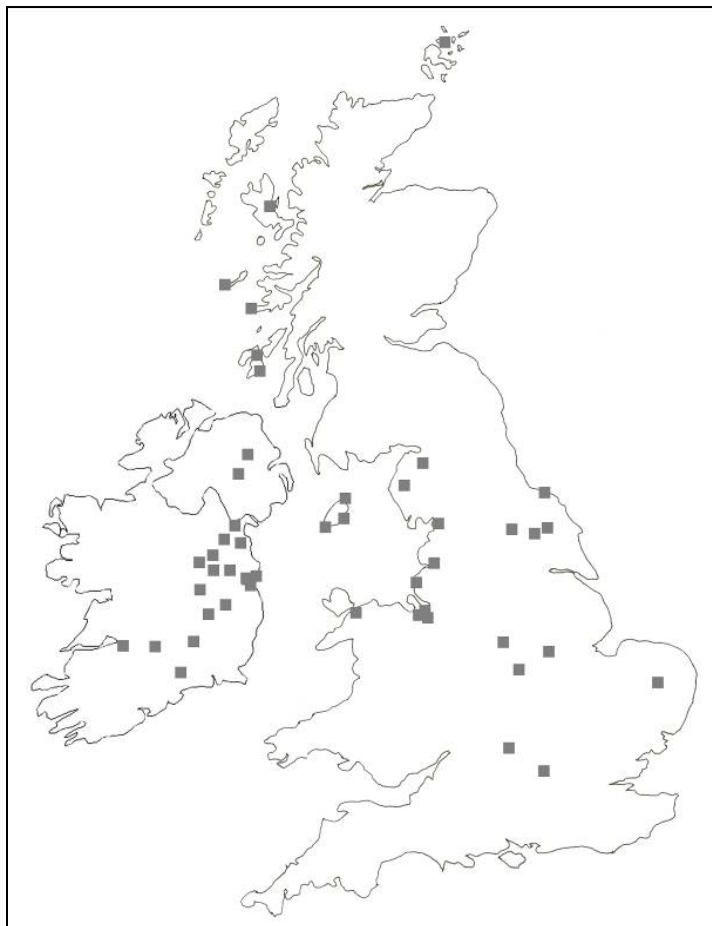


Figure 4.4 Map showing the distribution of Viking-age hoards in Britain. The hoards contain coins produced in many kingdoms and are not differentiated here. This map includes Ireland as a substantial number of hoards have been discovered there, although due to the illegality of metal-detecting, the single find evidence is poor for Ireland.

Comparison with the map of single finds in Figure 4.5 shows that levels of metal-detecting and excavation is an unlikely explanation for the pattern of hoards, as Viking-Age single finds are concentrated in the south and east of England. Single finds of coins are seen

clustered around the major urban centres of Anglo-Saxon England, such as York, Lincoln, Winchester, London, Norwich and Ipswich, and there are also more single finds in more rural areas along the eastern side of England. But what do these finds represent? Which kingdoms minted the coins, and which used them? These questions will be discussed in detail below, where the finds from coins minted in different kingdoms will be examined.

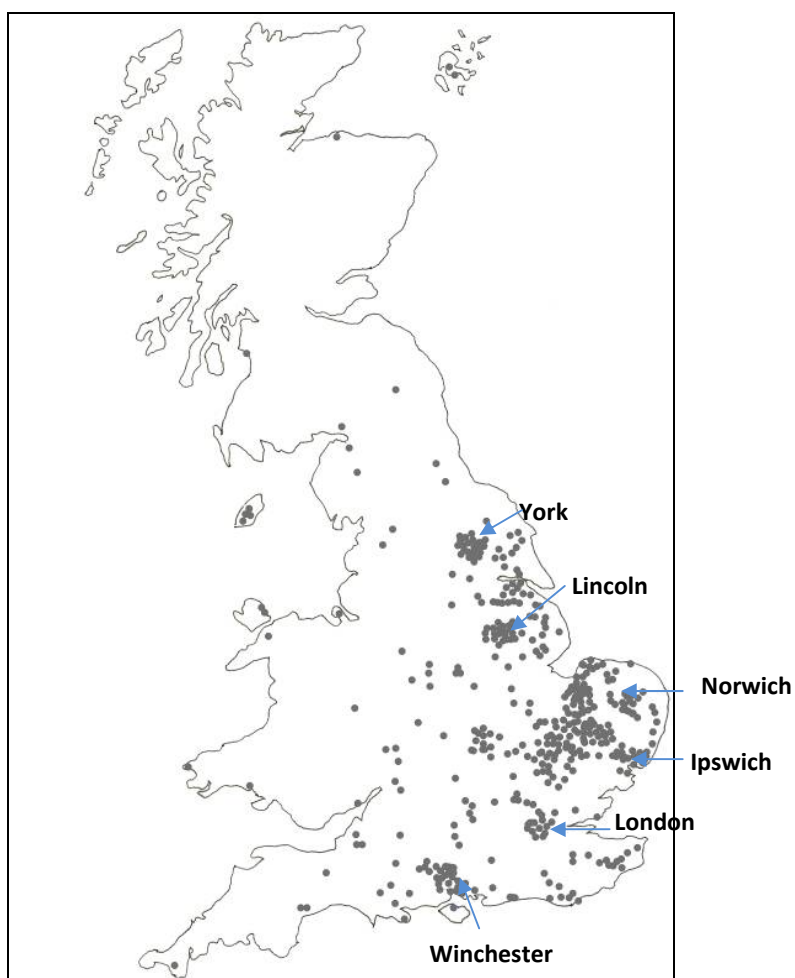


Figure 4.5 Map showing the distribution of all Viking-Age single-finds. The PAS does not cover any part of Ireland or Scotland, and as such any dots on this map are from sources other than the *Portable Antiquities Scheme* such as the *Early Medieval Corpus*.

The most obvious conclusion to draw from these two maps, is that the hoard evidence is skewed towards the north, and towards the Irish Sea region, as defined and discussed by scholars such as Griffiths, Graham-Campbell and Sheehan.⁴⁶ By contrast, the single-find data has an eastern concentration in the Northern and Southern Danelaw, and clusters of finds around the major the Anglo-Saxon centres of London and Winchester. The data shown above is for all Viking-age coins, not just coins made in the Northern Danelaw, and the lack of hoards in the south of England would suggest that hoarding did not occur in the West Saxon kingdoms which was more stable politically than the North, which was subject to invasions in the late- ninth-century by the Vikings who created the Viking Kingdom of York, and by the kings of Wessex and later of England in the 920s to the 950s. This interpretation assumes that the hoards in question were emergency hoards buried in times of strife, rather hoards buried for savings were reasonably stable in numbers. As discussed above, the difference between emergency and savings hoards can be difficult to discern. In the case of the Viking-age hoards shown here, many were discovered in the nineteenth century or earlier and so the information that would help differentiate between types of hoards is absent. It therefore cannot be assumed that all the hoards deposited here were emergency hoards and that they are indicators of an unstable kingdom. It must also be remembered that the number of hoards seen on these maps is only a small proportion of the number which would have been buried in the Viking age, as most hoards which were buried would have been recovered.

⁴⁶ D. Griffiths, 'The Coastal Trading Ports of the Irish Sea', in *Viking Treasure from the North West: The Cuerdale Hoard in its Context* (Liverpool Museum: National Museums and Galleries on Merseyside Occasional Papers, 1992), pp. 63-72; J. Graham Campbell, 'The Cuerdale Hoard: Comparisons and Context', in *Viking Treasure from the North West: The Cuerdale Hoard in its Context* (Liverpool Museum: National Museums and Galleries on Merseyside Occasional Papers, 1992), pp. 107-115; J. Sheehan, 'The Form and Structure of Viking-Age Silver Hoards: The Evidence from Ireland', in *Silver Economy in the Viking Age*, ed. by J. Graham-Campbell and G. Williams (Walnut Creek: Left Coast Press, 2007), pp. 149-162.

What can the hoards, and the coins contained within them, tell us about the use of money in the Viking age, and the political reach of the Viking kings of York? All of the hoards of the Viking age contain some Anglo-Saxon coins, from the hoards buried in the heart of the West kingdom such as at Kintbury (Oxfordshire), to those buried in Orkney and the Hebrides. This shows that Anglo-Saxon coins were used far and wide, which is not surprising given that the Anglo-Saxon kingdom was the largest and most powerful kingdom in the British Isles in the Viking age, and its coins would have circulated as they were numerous, recognisable, and also the stamp of authority of the Anglo-Saxon king in their design was a guarantee of quality and value. The coins of the Northern Danelaw had no such universal acceptance and are only found in hoards in the north of England, Ireland and the Scottish Islands. As with the distribution of Anglo-Saxon coins in hoards, it can hardly be said that the presence of these coins denotes that the Viking kings had direct control of the Scottish Islands just because coins were found there. The St Edmund Memorial pennies which were minted in the Southern Danelaw appear to have a similar distribution in the North of England and East Anglia to the coins of the Northern Danelaw. It is noticeable that there are far fewer Southern Danelaw coins than Northern Danelaw coins found in Irish hoards. This can be accounted for by the close relationship of the Viking kings of York to the Viking kingdom in Ireland; as presumably, as people travelled between the two kingdoms, they took coins made in York with them to Ireland.⁴⁷

⁴⁷ Downham, *Viking Kings of Britain and Ireland*, pp. 1-2; Smyth, *Scandinavian York and Dublin II*, p. 1.

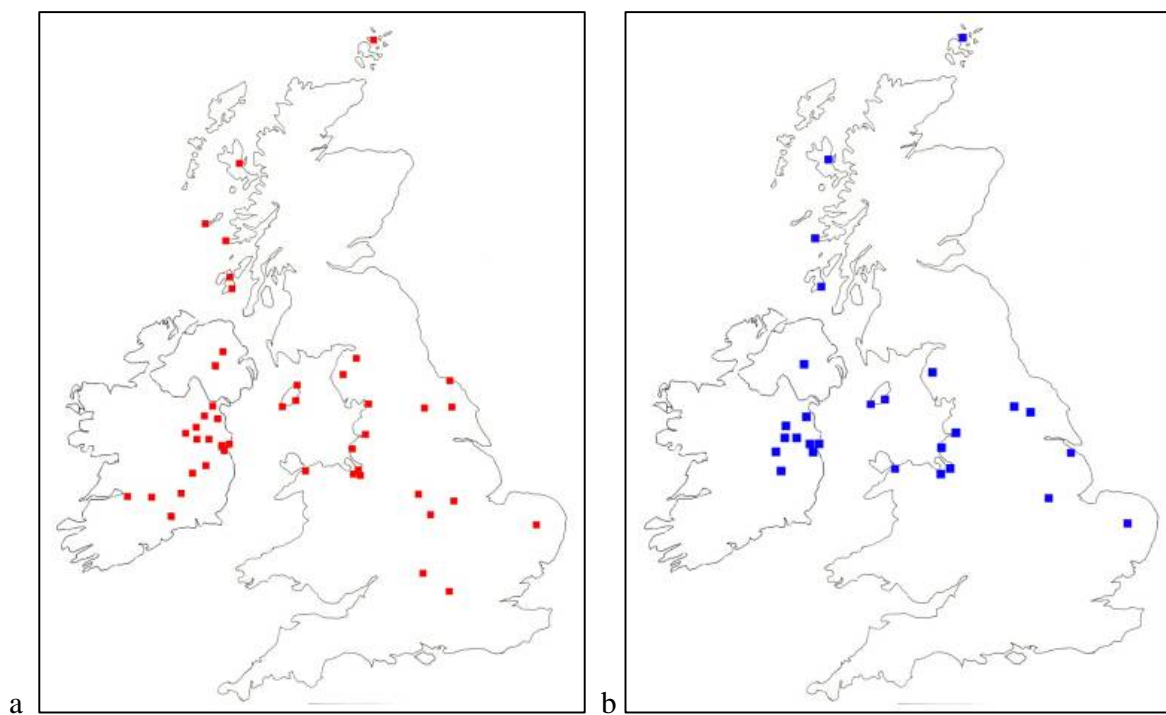


Figure 4.6 Maps showing the contents of Viking Age hoards in Britain, a) Coins produced in Anglo-Saxon England, b) Coins produced in the Northern Danelaw.

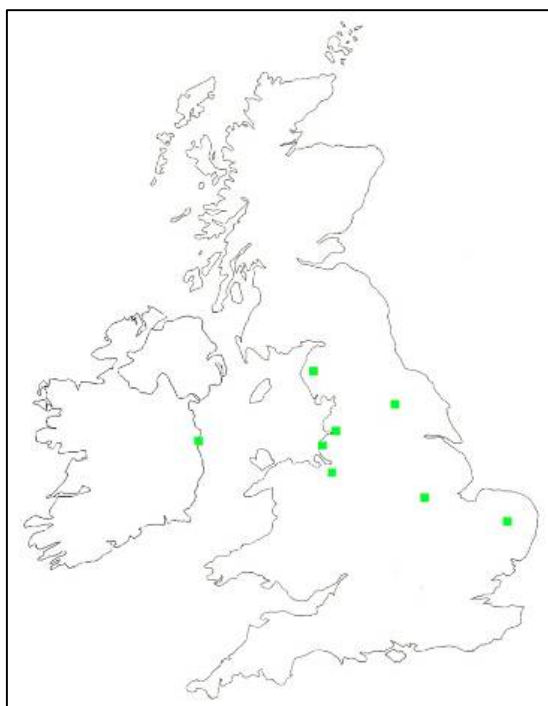


Figure 4.7 Map showing Viking Age hoards in Britain containing coins produced in the Southern Danelaw.

Moving from British coins to foreign ones, it is notable that Carolingian and Islamic coins are only found in the north of England, in Scotland and in Ireland. Once again, this cannot be because the Carolingian kings or Islamic dynasties held direct control over these places, but that their coins were acceptable. It is interesting that hoards found in the West Saxon kingdom do not contain coins foreign to that area, that is, any Northern or Southern Danelaw, Carolingian or Islamic coins. If this is compared to the model of political power based upon the exclusion of foreign coins in Carolingian Francia, the lack of foreign coins in hoards in Anglo-Saxon England would mean that the Anglo-Saxon kings had great political power. From the evidence of the hoards, it appears that only Anglo-Saxon coins circulated in West Saxon England and foreign coins were excluded by powerful kings who could issue and enforce laws forbidding the use of coins other than their own.

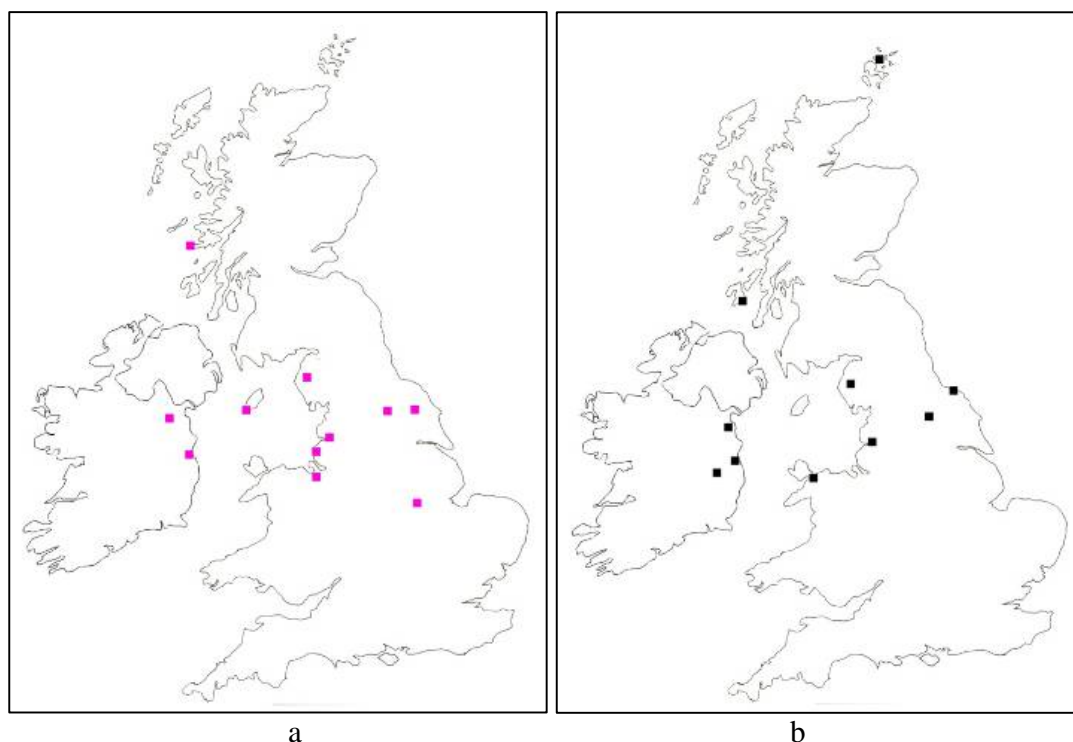


Figure 4.8 Maps showing the contents of Viking Age Hoards in Britain. Hoards containing: a) Carolingian coins, and b) Islamic coins

The distribution of hoards in Britain seems to show that Anglo-Saxon coins were to be seen throughout the Danelaw, along with a mixture of York and East Anglian issues, and with foreign coins from the Carolingian and the Islamic worlds. The distribution of hoards from other countries has also shown a similar pattern, for example hoards found in Denmark also contain a mixture of Anglo-Saxon, Northern and Southern Danelaw, Carolingian and Islamic coins. But do these patterns inform us about coin circulation, or coin storage? Since medieval coins were made of silver, there was an intrinsic value in coins even when they were of foreign production. The issue of how money was used will be examined further in Chapter 5, but it is worth noting here that the pattern of coins in hoards is not necessarily representative of the money in circulation at any one time. Even if the distinction between emergency and savings hoards could be reliably discerned, it would still not be accurate to

say that a hoard represents a cross-section of coin types which were in circulation at the time they were buried. Instead the distribution of hoards shows areas in which coins of all kinds were collected and buried, and given the concentration of hoards in northern England, it is fair to say that the Viking Kingdom was unstable enough for people to find burying their wealth a necessary measure, more than their contemporaries in Anglo-Saxon England did.

The hoard evidence, however, shows a marked bias towards the west of the Pennines and the Irish Sea area. This concentration around the Irish Sea is indicative of links to Dublin and the Isle of Man. It has even been argued that all, or nearly all the Viking Kings of York were also kings of Dublin.⁴⁸ If the locations of these Irish Sea hoards are examined in Figure 4.9 below, it is clear that some were buried close to major routes between York and Dublin. Bangor was never claimed as part of Viking York, yet it is the site of a small hoard of coins containing five Sword type coins from the 920s. The nearby 'productive' site of Llanbedrgoch on Anglesey has uncovered several coins and items of hacksilver in recent years, indicating that the Bangor hoard is no anomaly of Viking activity.⁴⁹ The location of Bangor and Anglesey on the Irish Sea, with good sea access to Dublin and the Isle of Man, and sea and river links to Chester and on towards York, means it could well have functioned as a stopping point for Viking travellers. The hoards at Chester, combined with the archaeological evidence from excavations in the city, indicate that it was an important tenth-

⁴⁸ Smyth, *Scandinavian York and Dublin I*, p. 9; Downham, *Viking Kings of Britain and Ireland*, pp.79, 94, 100.

⁴⁹ R. Bland (ed.), *Treasure Annual Report 1998 – 1999* (Department for Culture, Media and Sport: London, 2000), numbers 85-7, 325; M. Redknapp, 'Viking-Age Settlement in Wales and the Evidence from Llanbedrgoch', in *Land, Sea and Home: Proceedings of a Conference on Viking-Period Settlement at Cardiff, July 2001*, ed. by J. Hines, A. Lane and M. Redknap (Leeds: Maney, 2004), pp. 159-75.

century urban centre, and the settlement of the Viking leader Ingimund in 902/3 near Chester indicates that Chester was an important trading point in the Viking age.⁵⁰

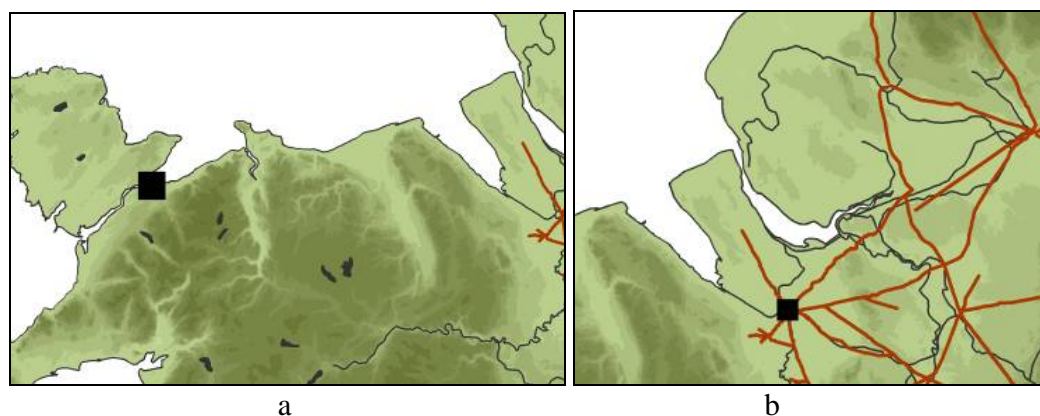


Figure 4.9. Maps of hoard locations (black) in the Irish Sea area, showing the lines of Roman roads (orange). a) Bangor (Gwynedd), b) Chester (Cheshire).

Chester was also a useful departure point in England for Dublin, and the presence of three hoards in that city, indicates that there was a Viking presence in Chester. The hoards vary in size from the small St John's and Castle Esplanade hoards which probably contained 40-80 coins, and the St John's hoard containing six York coins, to the Eastgate hoard of over 500 coins, three of which were made in York. Two of the hoards, Eastgate and Castle Esplanade, were found within the old city walls and the St John's hoard was found in the foundations of a building just outside the walls and adjacent to the remains of a Roman amphitheatre. The city of Chester itself is ideally located for access to the Irish Sea via the Rivers Dee and

⁵⁰ D. Griffiths, 'The Archaeological Background', in *The Huxley Viking Hoard: Scandinavian Settlement in the North West*, ed. by J. Graham-Campbell and R. Philpott (Liverpool: National Museums Liverpool, 2009), pp. 16-17; Downham, *Viking Kings of Britain and Ireland*, p. 83.

Mersey, and was the centre of a nexus of Roman roads which may have survived into the tenth century.⁵¹

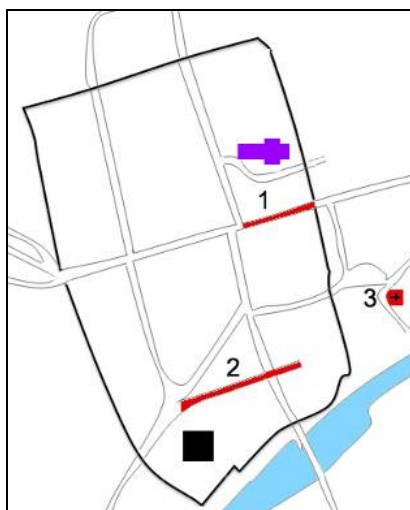


Figure 4.10 A Map of the Chester, showing the locations of the three hoards in red. 1) Eastgate, 2) Castle Esplanade, 3) St John's. The Cathedral is marked in purple and the castle in black.

The Harkirke hoard was buried on a small outcrop of higher ground inland from the coastal sands near Crosby in Lancashire. Although sited far away from any Roman routes, it is the proximity to the sea which is surely the reason for the burial here of thirty-five coins, mainly of Northern Danelaw types.⁵² Dean, which is further north along the west coast of Britain is farther away from the coast, but placed near several Roman roads which may have still been in use by the tenth century.⁵³ Dean is also in an area rich in Viking Age stone sculpture, including hogback stones, and quite near the meeting place of Æthelstan and various kings in 926 at Eamont Bridge.

⁵¹See I.D., Margery, *Roman Roads in Britain* (London: Baker, 1957), for maps of Roman roads and F. Stenton, 'The Road System of Medieval England', *The Economic History Review*, 7 (1936), 1-21, for a discussion on the likelihood of the existence of those and other roads in medieval England.

⁵² Margery, *Roman Roads in Britain*, road number 70.

⁵³ Ibid., road numbers 75, 750, 751, 752, 753, 754, 869.

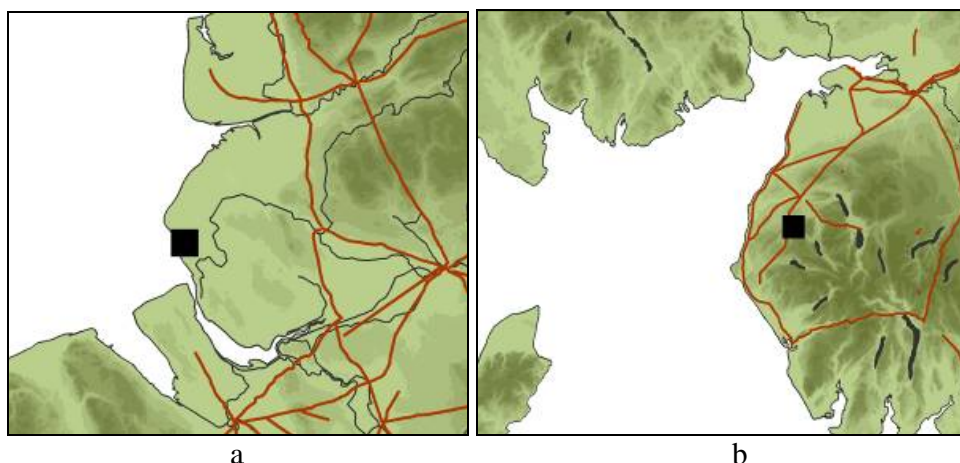


Figure 4.11 Maps of hoard locations (black) in the Irish Sea area, showing the lines of Roman roads (orange). a) Harkirke (Lancashire), b) Dean (Cumbria).

The proximity of the Dean hoard to so many Anglo-Scandinavian sculptures is interesting, as there were objects which required an investment of skilled workmanship to create them, stone sculptures are the products of the settled elite, who had both the time and money to commission these works, as well as enough security in their land to believe that they would be able to enjoy the products of that investment.⁵⁴ It is also useful to look at an indicator of Viking influence that is not numismatic and which may give an idea of the geographical extent of the Viking Kingdom. Hogbacks, like many stone sculptures, are found in churchyards, and most will have been originally installed in these Christian contexts, even though some feature pagan myths. The hogback stone is one of many types of Viking-age stone sculpture. There are distinctive styles of decorative sculpture based upon the Jellinge and Borre styles of Scandinavia which are found across the north of England.⁵⁵ Some of these stones also feature images of Norse Pagan mythology such as a depiction of Ragnarok on a stone at Ovingham, Northumberland, or Thor's fishing trip for the world serpent which

⁵⁴ Two new Cumbrian hoards were found in 2011, near to Silverdale and Dalton in Furness.

⁵⁵ Bailey, *Viking Age Sculpture*, pp. 54-8.

is featured on a stone at Gosforth, Cumbria.⁵⁶ Other Viking period styles of stone sculpture include circle-headed and hammer-headed crosses.⁵⁷ The hogback is a distinctive stone monument in the shape of a contemporary Scandinavian house, with long bowed sides and an arched roof.⁵⁸ The stones sometimes have a tile-like pattern to represent a roof, and sometimes have beasts at each end gripping the hogback. They have been dated to the tenth and eleventh centuries, and so are firmly within the Viking period of York, and have been explicitly associated with that kingdom and its short independence under Viking Kings.⁵⁹

Stone sculpture is not a direct indicator of settlement, and the prevalence of sculpture in some areas is as much an accident of survival as coin losses. A map of hogbacks will not show exactly where Vikings lived, but it does give an indication of how far the cultural influence of the Vikings in York reached, and may indicate areas of higher population or merely of higher artistic investment and availability of suitable stone.

⁵⁶ Ibid., pp.131, 133.

⁵⁷ R. Cramp, *Corpus of Anglo-Saxon Sculpture 2: Cumberland, Westmorland and Lancashire North-of-the-Sands* (Oxford : Published for the British Academy by the Oxford University Press, 1988), p.31.

⁵⁸ J. Lang, 'The Hogback: A Viking Colonial Monument', in *Anglo-Saxon Studies in Archaeology and History*, 3, ed. by S. Chadwick Hawkes and J. Graham-Campbell and D. Brown (Oxford: British Archaeological Reports, 1984), p. 91.

⁵⁹ Lang, 'The Hogback', pp. 97.

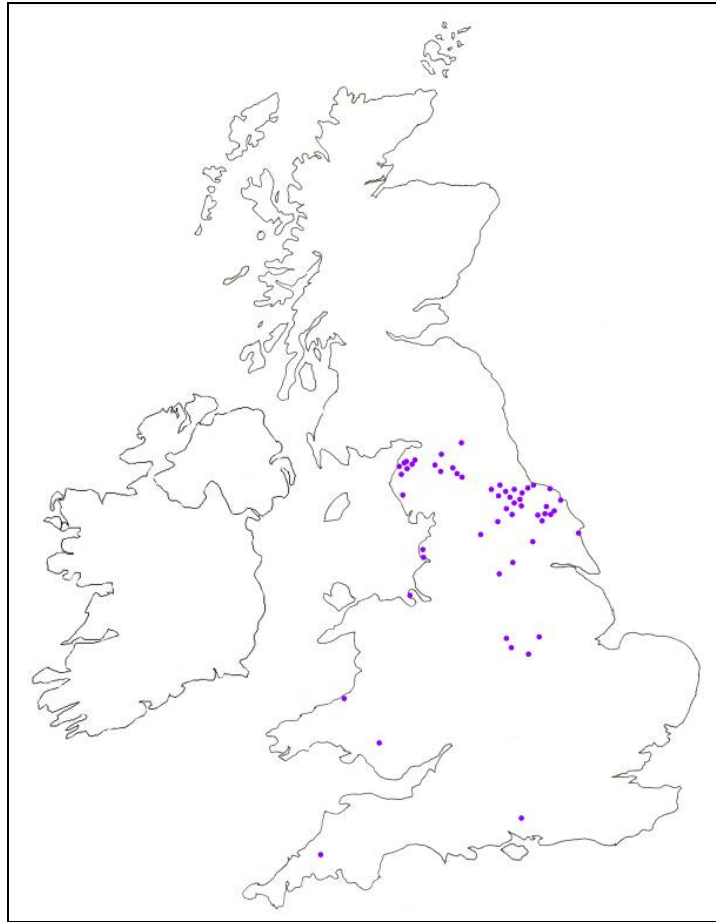


Figure 4.12 Map showing the distribution of hogback stones in Britain. The hogback is a distinctively Viking style of sculpture and is found predominantly in the Eden and Tees valleys, and is not found north of the Tyne.⁶⁰

In Figure 4.12 above, the distributions of hogbacks can be seen, all of which are dated to the tenth or eleventh centuries. Concentrations of hogbacks, interestingly, are not found centred upon York, although one fragment has been found there, but they are found much farther north, around the Tees and the Eden valleys. There are some outliers with two in Wales, but none on the Isle of Man or around Lincoln; the hogback is a Northumbrian rather than

⁶⁰ Locations taken from *The Corpus of Anglo-Saxon Stone Sculpture* (Durham University), which can be found at <http://www.dur.ac.uk/sculpturecorpus/> [accessed on 15 August 2011].

Southumbrian art form.⁶¹ Interestingly the area north of the Tyne is bare of these monuments, perhaps indicating that the community of St Cuthbert shunned this form of sculpture with its Pagan roots, far more readily than the rest of the Northumbrians.⁶² If one were to look at just the hogback distribution map above, York would not be recognisable as the capital of the Viking Kingdom. Yet the hogback evidence does show that Viking culture was flourishing away from the centre and that the border between Viking York and the Community of St Cuthbert and the Earls of Bamburgh was not merely a political one, as seen with the Battle or Battles of Corbridge, but also a cultural one, perhaps even a hangover from the old Northumbrian kingdoms of Bernicia and Deira.

The hoard which has generated the most amount of interest in the Viking period is the Cuerdale hoard, which is situated neither in the heartlands of the Kingdom of York, nor in close proximity to any signs of Viking culture or settlement in Cumbria or the Tees valley. This hoard contained around 7,000 coins, around 3,000 of which were made in York, was found in Lancashire near several Roman roads and on a good route between York and Dublin. The scale of the Cuerdale hoard is so unlike any other hoard of this period, even the Vale of York hoard that many explanations have been given to account for the burial and non-recovery of this great treasure.⁶³ It is generally assumed to have been deposited by a wealthy Viking travelling between York and Dublin. Cuerdale's position on the banks of the River Ribble near Preston would have been convenient for sea travel between Dublin and the west coast of England, followed by river travel and then a journey over the Pennines along

⁶¹ Lang, 'The Hogback', pp. 87-8.

⁶² Ibid., p. 90.

⁶³ Graham-Campbell, 'Comparisons and Context', pp. 113-15.

the route of the old Roman road which followed a natural pass in the hills as shown below in Figure 4.13.

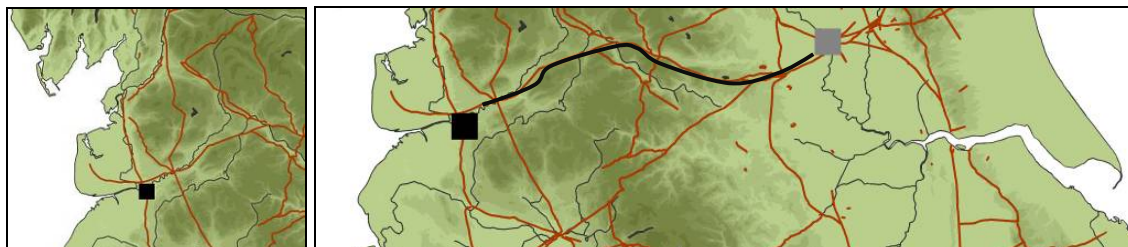


Figure 4.13 The Cuerdale hoard (black) and York (grey) shown with Roman roads (orange). The journey between Cuerdale and York (black line) could have been easily achieved by travelling across the Pennines following the route of the old Roman road. In fact this was probably the quickest route from York to the west coast and thence to Dublin.

Other hoards on the Irish Sea region include hoards in the Scottish islands such as Mackrie, Tiree and Portree in the Inner Hebrides, Skaill in the Orkneys, Andreas, Ballaqueeny and Douglas on the Isle of Man, all with easy access to the Irish sea.⁶⁴ The Irish hoards are not all coastal, but are clustered around Dublin and its wider hinterland, with the exception of Armagh. Other hoards containing Anglo-Saxon coins but no York coins have also been found in Northern Ireland, which means that Armagh is not so much of an outlier. The hoards found east of the Pennines are interesting in that these were deposited where the York coins were used, and may therefore represent the currency in use in York rather than in Ireland, Man or Scotland. The hoard at Walmgate, York was found in the known area of

⁶⁴These hoards can be seen in the Gazetteer of Hoards, Appendix IV; Mackrie, Tiree and Portree: R.B.K. Stevenson, 'The Iona Hoard of Anglo-Saxon coins', *Numismatic Chronicle*, 6th ser. 11 (1951), 68-90; Skaill: G. Petrie, 'List of Treasure Trove, from Orkney and other Places, presented to the Museum by the Exchequer', *Proceedings of the society of Antiquaries of Scotland*, 3 (1857/60), 246-7, 249-50; Douglas: H.E. Pagan, 'The 1894 Ballaquayle Hoard: Five Further Parcels of Coins Æthelstan-Eagdar', *British Numismatic Journal*, 50 (1980), 12-19; Griffiths, 'Coastal Trading Ports', pp. 63-72 discussed the role of the Irish sea in trading and the deposition of hoards.

Viking settlement in that city, but very little is known of the composition of the hoard since it was dispersed shortly after discovery and with little attempt made to record its contents.⁶⁵ The hoards known as Vale of York and Bossall/Flaxton are also of interest for the York coins they contain.⁶⁶ Vale of York is the second largest Viking hoard after Cuerdale and contains nearly thirty Sword coins, along with over 500 Anglo-Saxon, Carolingian and Islamic coins.⁶⁷ The exact location of the hoard site is not known, but it is known that the site is near the River Nidd in the Vale of York suggesting that it was connected with some habitation in the area, or with movement of travellers between York and its environs. Similarly the Bossall/Flaxton hoard, which was found on the current and ancient road from York to Malton, indicates either that there was settlement in the York hinterland, or travel along this road towards the north-east coast.

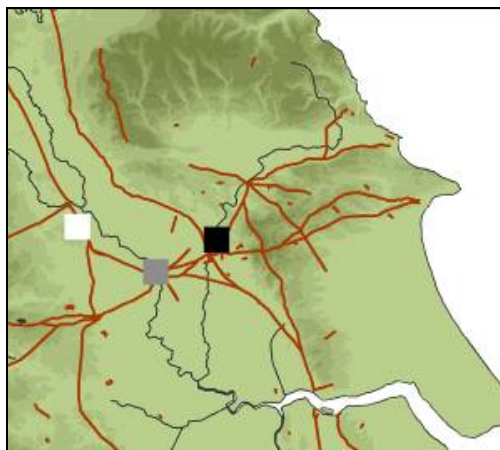


Figure 4.14 Map showing location of Bossall/Flaxton (black), York (grey) and Vale of York hoards, approximately (white) hoards with Roman roads marked in orange.

⁶⁵ G.J. Chester, 'An Account of a Recent Discovery at York', *Archaeological Journal*, 13 (1856), 287.

⁶⁶ G. Williams, 'The Coins from the Vale of York Viking Hoard: Preliminary Report', *British Numismatic Journal*, 78 (2008), 227-34; Blunt and Stewart, 'Coinage of Regnald I', 146-63.

⁶⁷ Williams, 'Vale of York: Preliminary Report', 227-34.

The Southumbrian hoards of Morley St Peter (Norfolk), Thurstaston (Leicestershire), and Tetney (Lincolnshire), are located in Danelaw areas.⁶⁸ Morley St Peter lies near to several Roman roads and the medieval track, the Icknield Way, across Norfolk between Norwich and Thetford in the heart of the Southern Danelaw.⁶⁹ Thurstaston is situated very close to Leicester, one of the Five Boroughs, and Tetney on the Lincolnshire coast near Grimsby, with access to the North Sea. Whilst none of these three hoards is buried in locations with easy access to Dublin, they were still buried within what may have been Viking areas of England, and show that York coins were suitable treasure and wealth throughout the Danelaw.⁷⁰

From this overview of hoards containing coins of the Northern Danelaw it can be seen that many were deposited within areas that Vikings would have travelled through en route between the kingdoms of Dublin and York. However, hoards were not just deposited whilst en route between Viking kingdoms; it appears from the Southumbrian hoards that coins were also used and buried. The Scottish, Irish and Manx hoards give the distinct impression that coins of any sort, including those made at York, were regularly hoarded for safety, and the implications of this, along with the other objects hoarded together with the coins will be examined more closely in the next chapter. The distribution of hoards in the north of England shows that money was stored in small and large quantities, and this combined with the single find evidence shows that although coins made in York were mainly used in York,

⁶⁸ T.H. McK. Clough, *Museums in East Anglia: Morley St Peter Hoard and Anglo-Saxon, Norman, and Angevin Coins, and Later Coins of the Norwich Mint*, Sylloge of Coins of the British Isles, 33 (London: Spink, 1980); M.A.S. Blackburn, 'A Viking Hoard from Thurstaston, Leics.: A Preliminary Report', *Numismatic Chronicle*, 161 (2001), 349-52; J. Walker, 'A Hoard of Anglo-Saxon Coins from Tetney', *Numismatic Chronicle*, 6th ser. 5 (1945), 81-95.

⁶⁹ Stenton, 'Road System of Medieval England', p. 3.

⁷⁰ See Gazetteer of Hoards, Appendix IV for details of hoards.

they did also travel farther afield, although generally only to other Viking areas such as the Southern Danelaw, Ireland, the Isle of Man and the Scottish Islands.

If the hoards say more about political stability than anything else, it is the single find distributions which can reveal more about the coins in circulation in the Viking age.

The map of Anglo-Saxon single finds shows that Anglo-Saxon coins form the majority of coin finds for the Viking age. Anglo-Saxon coins were lost and not recovered all over England, with some concentrations of losses in the major tenth-century urban centres of London, Winchester, Lincoln, York, Leicester, and Thetford. This contrasts with the hoard evidence above in Figure 4.6a, where very few Anglo-Saxon coins were found in hoards in the areas of Anglo-Saxon kingdoms. Notably, there are no single finds of these coins in Ireland or Scotland, because there is no data available to analyse, but there are also few Anglo-Saxon coins found in the Hebrides and Scotland, compared to the number of Anglo-Saxon coins found in hoards for the same period. It is interesting to note that there are plenty of single finds in East Anglia, north of the Humber, and even on the Isle of Man, as there are with Anglo-Saxon coins in hoards. The difference is that the single finds show a pattern of coin-use rather than of coin savings, and it can be assumed that the majority of these coin finds represent coins which were lost during economic transactions. As such, the pattern of Anglo-Saxon coins in areas thought to be under Viking control such as York and its hinterlands is interesting. If it were only Anglo-Saxon coins which were in circulation in and around York, it could be concluded that this pattern represents either the period when the Anglo-Saxon kings ruled York, or that the Anglo-Saxon kingdom stretched much farther north than previously imagined. What this pattern does not tell us is that there were more

Anglo-Saxon coins produced than Viking coins as it has been shown in Chapter 3, that this is not a statistically viable method for gaining the volume of a coin type, and that the mint of York was producing coins in numbers large enough to support the economy of York and the lands to the north of the Humber.⁷¹

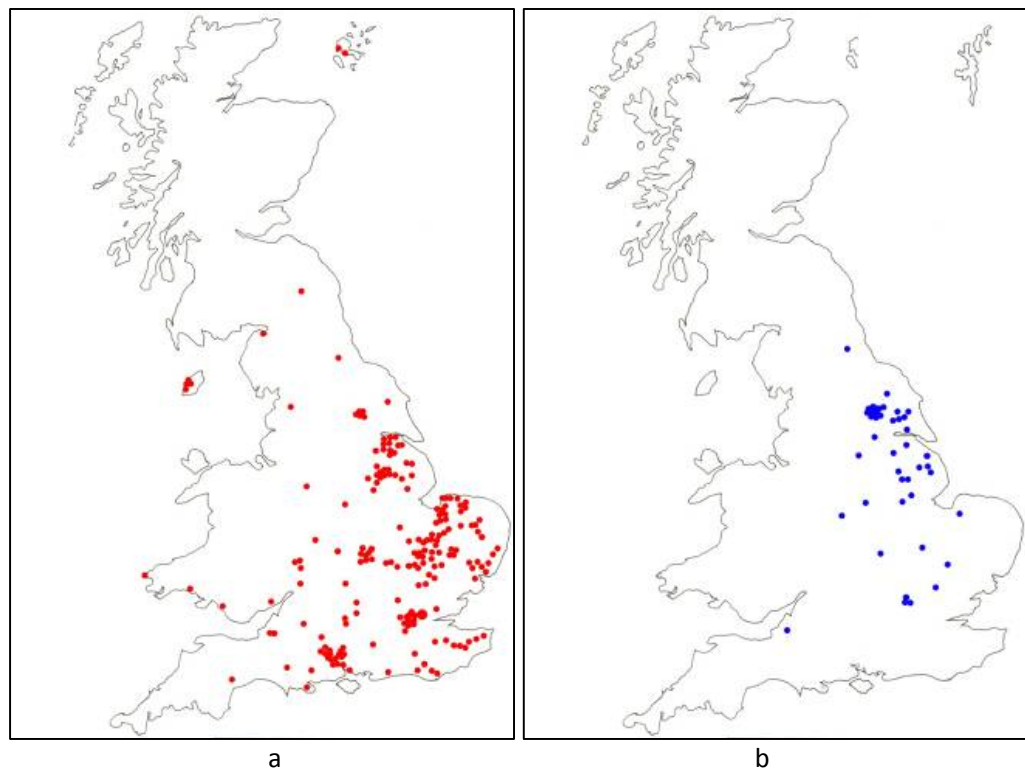


Figure 4.15 Maps showing single finds in Viking Age England. Showing single finds of coins produced in a) Anglo-Saxon England, and b) the Northern Danelaw.

However, it is not just coins made in Anglo-Saxon England that were circulating in and around York in the Viking Age. Figure 4.15a above shows that there is a large concentration of coin finds in York, and also groups of finds in the East Riding of Yorkshire, in Lincolnshire, and around the Five Boroughs. It is to be expected that the finds of coins

⁷¹ See Chapter 3, pp. 153-4.

minted in York should be concentrated in that city, and the use of Viking coins north of the Humber, and in the Five Boroughs confirms what is known from the historical sources about areas of England that the Vikings held. Interestingly, there are few coins of Viking York found in East Anglia, and if the distribution is compared to Figure 4.16 below, it can be seen that this is because coins minted in the Southern Danelaw seem to have circulated widely in that area. Coins produced in the Southern and Northern Danelaw both seem to have circulated in the Five Boroughs and the East Midlands, but does this reflect the distance of these areas from where the coins were minted, or does it show a pattern of political authority in which coins of either Viking kingdom were acceptable?

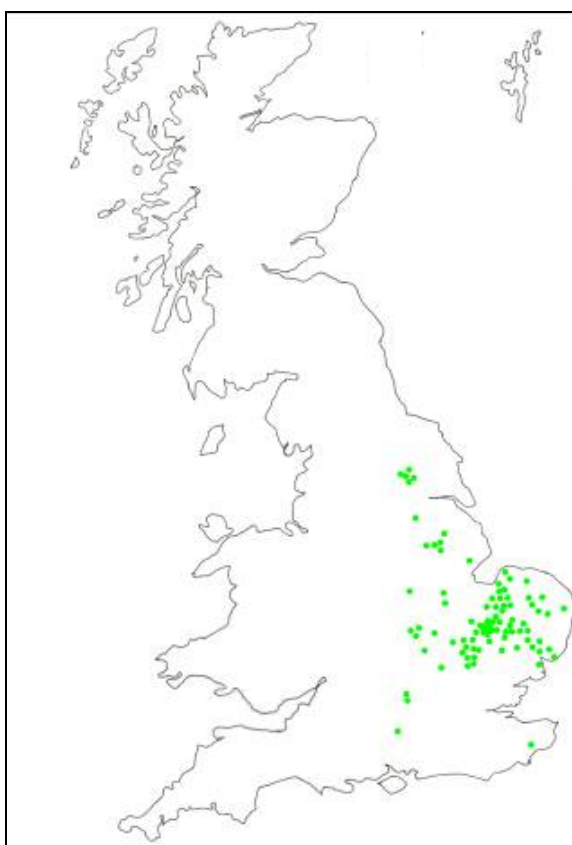


Figure 4.16 Map showing single finds of coins produced in the Southern Danelaw in Viking Age England.

The coins of the Northern Danelaw are shown as the different coin types in Figure 4.17 below, to see if there is any pattern in the chronology of the distribution of Northern Danelaw coin finds. All of the coin types were used in or very near to York. The coin finds of Cnut and Siefred (classified here as the Regal types) did not circulate far from York, and were mainly used north of the Humber. The Swordless St Peter and Sword types appear to have circulated in the Five Boroughs, and a small cluster of Sword coins from the 920s appears very far south, but it is hard to draw sound conclusions on such limited evidence. The finds of coins produced after Anglo-Saxon annexation are very few indeed, but they do not seem to have circulated far from their place of production in York, with a few finds in the Five Boroughs. This slim evidence shows that even after the weight standard change instigated by Æthelstan to make York coins the same metal value as their Anglo-Saxon counterparts, it seems there was something more than the inherent value of these coins which prevented their circulation outside of the Viking Kingdom of York.

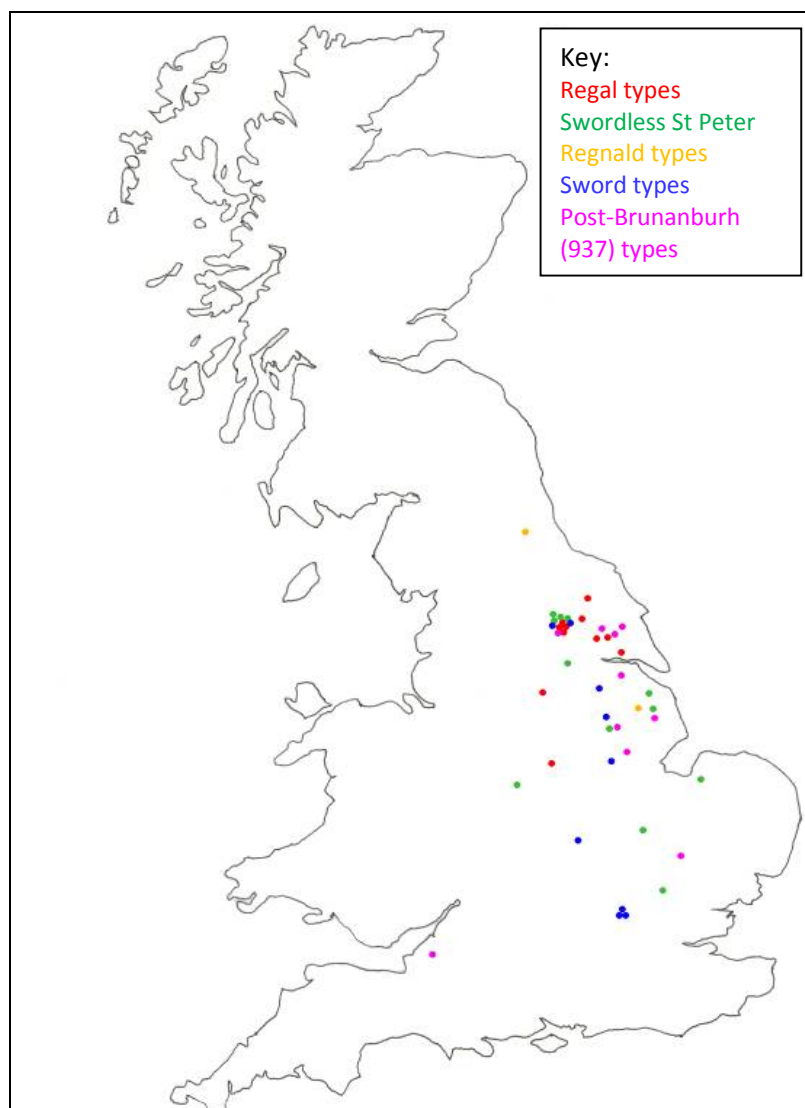


Figure 4.17 Map showing single finds of the Northern Danelaw, differentiated according to coin type. The coins in this map were all made at York under Viking control and do not include the coins made at York under Æthelstan or his Anglo-Saxon successors.

If the distribution of Viking coins made at York is compared to the distribution of the earlier ninth-century stycas made in York, it can be seen that the earlier coins circulated more widely. Stycas were coins made of base metal and as such had a substantially lower inherent value from low silver content than the contemporary silver sceattas and pennies in other

Anglo-Saxon kingdoms. Despite the difference in value, stycas appear to have circulated widely in the Kingdom of Northumbria, and in Lincolnshire and East Anglia with a similar distribution to the Viking coins of the Northern Danelaw. However, the stycas seem to have a wider distribution and are found further north and west than the Viking coins.

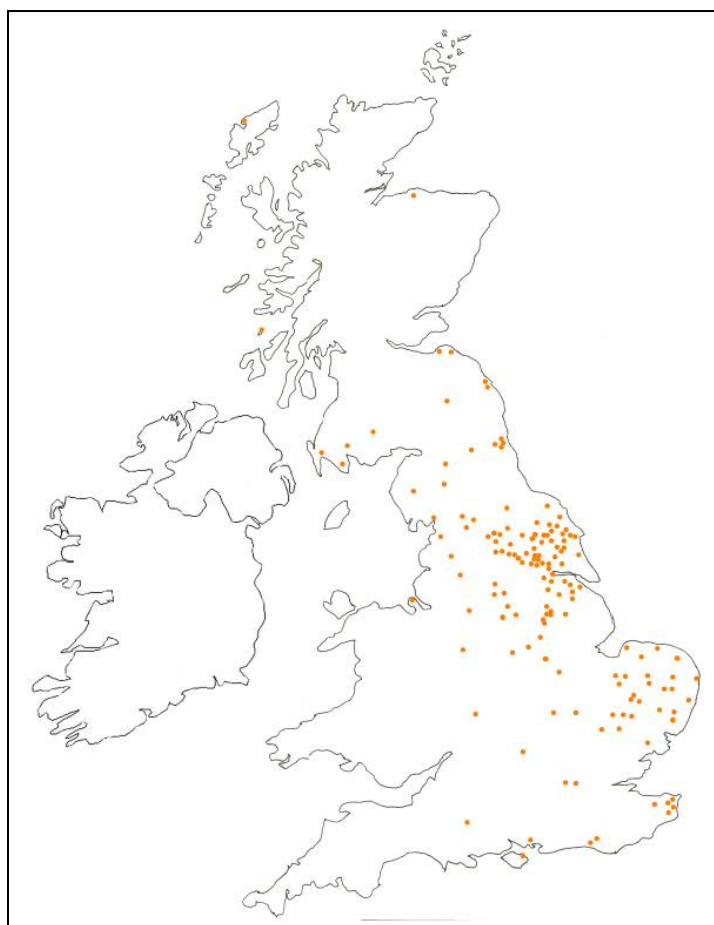


Figure 4.18 Map showing distribution of stycas finds from c.800 to c.867.⁷² Stycas were Northumbrian base-metal coins, and the distribution here shows a bias towards the east of the Pennines and around York, with some find in East Anglia and stretching up towards Berwick, Edinburgh and Dumfries.

⁷² The definitive work on this series is E.J.E. Pirie, *Coins of the Kingdom of Northumbria, c.700-867 in the Yorkshire Collections: The Yorkshire Museum, York, the University of Leeds, the City Museum, Leeds* (Llanfyllin: Galata, 1996).

Coins made in the Anglo-Saxon kingdoms appear to have circulated in East Anglia, the Five Boroughs and the East Midlands as well. This may be to do with the fact that the St Edmund pennies were only made in the first quarter of the tenth century, after which time Anglo-Saxon coins were produced in East Anglian mints and were used in that part of the country. Although Anglo-Saxon coins are found north of the Humber and in East Anglia, there was little use of coins made in these areas of Anglo-Saxon England. This shows that whilst Anglo-Saxon coins seem to have been acceptable currency throughout England, even in areas not under the direct control of the Anglo-Saxon kings, the same cannot be said of Danelaw coins. Was this because the Anglo-Saxon kings had such a degree of political control over their currency that they could exclude coins not made under their control from circulation in their lands, or was it because there were no commercial or other contacts between kingdoms? The finds of Anglo-Saxon coins in York and East Anglia would indicate that there were commercial contacts, and so it must be concluded that most Viking coins were excluded from circulation in Anglo-Saxon England. These coins, in contrast to the Anglo-Saxon ones, do not appear to have been accepted currency outside the kingdom in which they were minted. The comparison between stycas and Viking coins leads to two conclusions: firstly that the different weight standard or silver fineness of coins was not necessarily a bar to circulation outside their area of production, and secondly that the Kingdom of Northumbria had a wider sphere of political influence than the Viking Kingdom of York. The Viking Kingdom was centred far more on the city of York and did not have as much influence further north than the Tees or Tyne, or west of the Pennines.

Was the exclusion of coins particular to those being minted in the Northern and Southern Danelaw, or did the Anglo-Saxon kings manage to exclude all foreign coins from their kingdoms? A look at the single find distribution for Carolingian coins at first seems to show that these coins were used mostly in the Five Boroughs, north of the Humber and in East Anglia, with areas of concentration on the south coast of England and in Winchester. This pattern would seem to show that Carolingian coins were accepted and used in the heart of the Anglo-Saxon kingdoms. However, many of these find spots are in coastal locations and ports where were traders brought their coins to be exchanged into Anglo-Saxon money, so the coins may have been lost before they really entered the kingdom. Another problem with this data is that many ninth-century Carolingian coins are found in Viking-age hoards. This distribution pattern could be interpreted as arising from a ninth-century phenomenon and rather than reflecting tenth-century Anglo-Saxon monetary policy; in other words, it would reflect the movements of the Great Army which would have moved around England carrying whatever coins its members came into contact with. There is, for example, evidence that some of the coins in the Cuerdale hoard, deposited in c. 905, were from Aquitanian mints, and it has been argued that these coins were acquired during Viking raids in that area in 898 and brought to England with the Great Army.⁷³ Figure 4.19a shows the distribution of both ninth- and tenth-century single finds and it can be seen that the clusters of coin finds around Winchester and many of the coastal finds consist of the earlier coins. It appears then that Carolingian coins, perhaps because of the movements of the Great Army, whose members were familiar with the design of these coins and trusted issuing authority, circulated in some areas of Anglo-Saxon England in the ninth century, but less widely in the tenth century.

⁷³ Williams, 'Cuerdale Coins', p. 60.

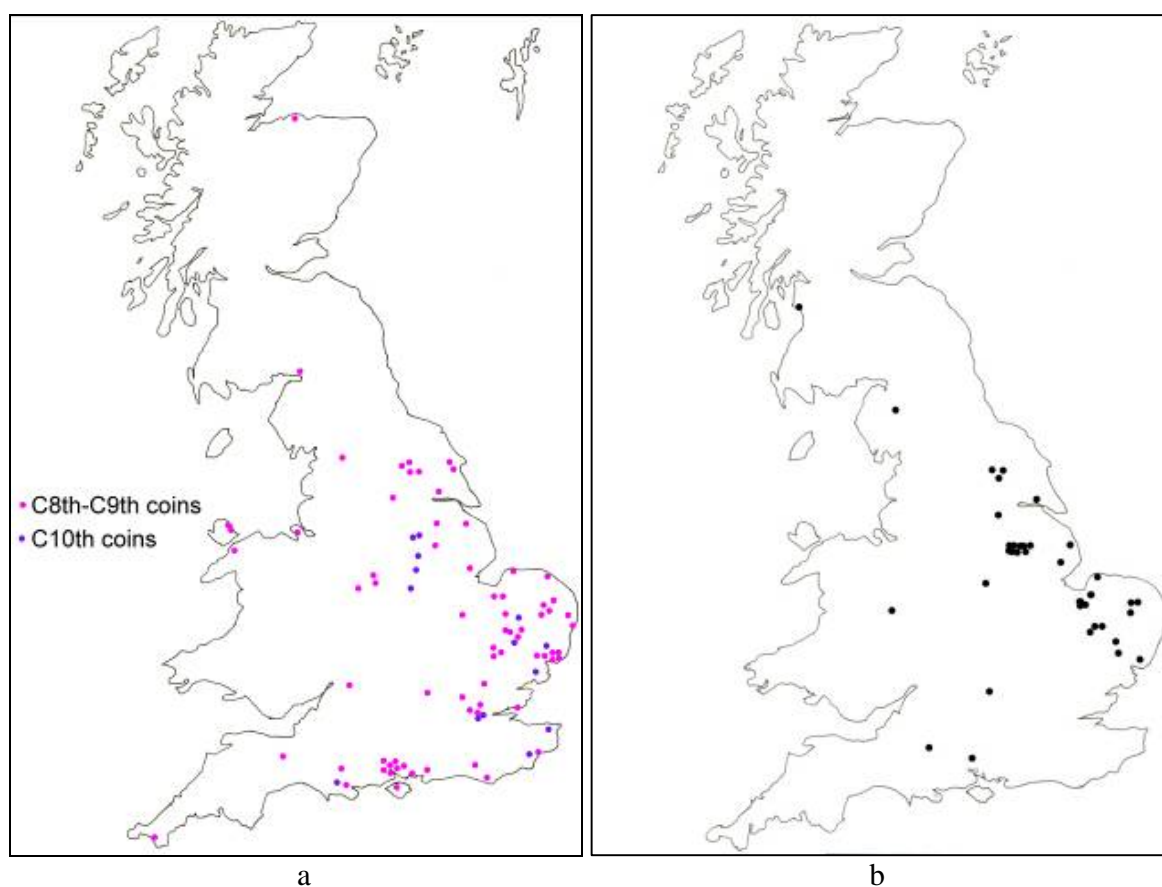


Figure 4.19 Maps showing single finds in Viking Age England. Showing single finds of coins produced in the a) Carolingian kingdoms, and b) Islamic empires.

Islamic coins, it appears, were too different in design, inscription, and weight to be used frequently in Anglo-Saxon England. They were, however, used frequently north of Watling Street, with clusters in East Anglia, Stamford, and York which can be seen in Figure 4.19b below. The finds of Islamic coins in contemporary Scandinavia shows that Islamic dirhams were familiar coin types and were a trusted source of silver, certainly as a convenient form of hacksilver, and maybe even as coins. Some of these single finds, and indeed Islamic coin finds in hoards, are in the form of fractional coins, either halves, quarters or smaller pieces. The division of the penny into quarters and halves is normal monetary practice in this period, but the division into irregular-sized and shaped fragments is more indicative of a bullion

economy using silver by weight rather than as coins. This issue of how money was used will be discussed more fully in Chapter 5, but we should note now that this fragmentation of coins generally only occurs with Islamic coins; Anglo-Saxon and Carolingian coins are not subject to this practice in England. This shows that while Anglo-Saxon and Carolingian coins were used as money because of they were official products of the states in question, Islamic coins were treated as a supply of bullion rather than as coins.

The distribution of coins discussed above has been used to discuss the political power of the Viking kings of York in the way in which they could impose the use of a particular type of coin upon their kingdom, and the areas in which the coins bearing their names were used. It is this single find evidence that provides valuable information about both the areas in which the coins of the Northern Danelaw were used, and from which areas they were excluded. The discussion above shows that the Vikings in York issued coins which were generally used north of the Humber and in the Five Boroughs, and to a lesser extent in East Anglia. Their coins were excluded from circulation in Anglo-Saxon England. This may have been because the coins of York were made to a slightly lower weight standard until Æthelstan's invasion in 927, or it may have been because the coins looked foreign and were not trusted by Anglo-Saxon traders. Given the evidence of the wide circulation of the base metal *stycas* beyond Northumbria, a more likely answer is that the Anglo-Saxon kings, like their Carolingian counterparts, wanted the monopoly on both coin production and on coin circulation to create a unified currency and an income from minting, and that they were able to enforce this exclusion of currency other than that which generated this income. It appears that the Viking kings of York enjoyed no such control, as coins minted in Anglo-Saxon England,

Carolingian Francia, the Islamic world and the Southern Danelaw all circulated to some extent north of the Humber and in the Five Boroughs. What does this pattern show about the borders of the Viking Kingdom of York, and does the presence of coins not minted in York mean that the Vikings lacked the political power to exclude currency from their kingdom?

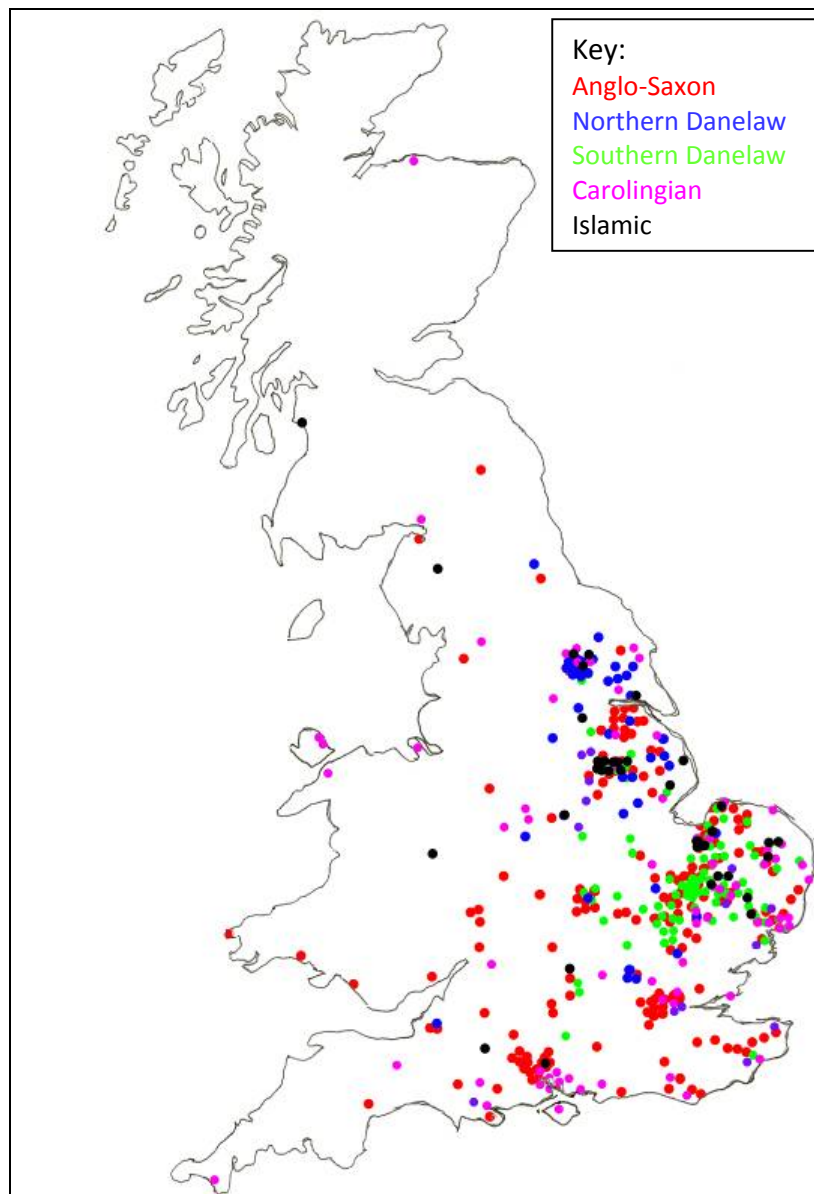


Figure 4.20 Map showing all Viking-Age single finds with finds differentiated using colour to show where they were minted.

Conclusion

If our understanding of the Viking Kingdom of York, of its borders especially, was based only on the historical evidence, there would be a limited knowledge of that kingdom. The chronicles give insights into the kingdom and its relationship with its neighbouring kingdoms at a handful of dates during its existence, but cannot be expected to give the whole picture. However, this evidence has been combined with an understanding of how to use numismatic sources in the form of hoards and single finds, and a look at the evidence of Anglo-Scandinavian stone sculpture to understand the patterns of political influence from the Viking Kingdom of York and how this may differ from its cultural sphere of influence.

It appears that coins made in York were largely used in York and its hinterland, rarely travelling too far south of the Humber, nor west of the Pennines in commercial exchanges; although, due to the topography of the Lake District, the limitations of the single find evidence must be borne in mind as metal detecting is not as popular on high altitude non-arable land, where finds are less likely. Furthermore it may be that the pattern of finds in Cumbria in part reflects not only the frequency of coin use in the tenth century, but also the frequency of modern-day metal detecting excursions in that area.

The evidence of hogback sculptures provides an interesting contrast to the distribution of coins produced in the Northern Danelaw. It shows that whilst Viking cultural influence spread far from York, especially across the Pennines in Cumbria, Viking coins were not necessarily used by everyone of Viking cultural heritage. The use of Viking coins was therefore not due to the lack of Vikings who had settled in areas distant from York. Neither

was it because there was a lack of Viking coins, as the evidence of die production discussed in Chapter 3 has shown that dies were produced in sufficient quantities to supply enough money for the Viking Kingdom. The lack of Viking coins in either single finds or in hoards to the south of Watling Street does indicate that Viking coins were being effectively excluded from Anglo-Saxon currency. However, the presence of coins produced in the Anglo-Saxon, Carolingian, Islamic kingdoms and the Southern Danelaw north of the Humber and in the Five Boroughs makes any firm identification of the territory of the Viking Kingdom of York impossible. However, the presence of this mixture of coins demonstrates that the Viking kings lacked the will or the power to exclude 'foreign' coins from York and any other areas which were under their control. It is the issue of whether the Vikings kings in York were unwilling or unable to restrict the use of foreign coins in their kingdom that is the subject of the next chapter. It will be asked whether the evidence from which strong political power as deduced for the Carolingian and Anglo-Saxon kings means that the Vikings had a weak grasp of their economy, or whether the ways in which money was used in the Kingdom of York leads to an alternative interpretation.

Chapter 5

How was money used in the Viking Kingdom of York?

In Chapter 4, the distribution of coin finds in the Viking Kingdom of York was discussed, and it was concluded that the distribution of coins not minted by the Vikings in York within the Northern Danelaw, meant that the Viking rulers had either lacked the ability or it reflected the Vikings' political weakness and inability to exclude coins which they had not produced from their kingdom. The purpose of this chapter is to investigate whether the presence of 'foreign' coins in the Viking Kingdom of York is because the Viking rulers could not, or did not, want to exclude coins which they had not produced from their lands. It will also be asked how money was used in the Kingdom of York, and how the coins produced in large quantities and distributed fairly widely north of the Humber and in the Five Boroughs were actually used. Most importantly, it will be asked what the use of money in the Viking Kingdom of York can say about the political power of the kings who ruled there.

Theories of the Viking-Age Economy

The subject of money and its use in Viking-age economies is not a new one; studies have been undertaken, especially on money in Viking-age Scandinavia and in Ireland, to attempt to understand how the hacksilver and coins were used and exchanged.¹ Three types of economy

¹ For example, B. Hårdh, *Silver in the Viking Age: A Regional-Economic Study* (Stockholm: Almqvist & Wiksell International, 1996); J. Sheehan, 'Social and Economic Integration in Viking-Age Ireland: The Evidence of the

have been proposed for Viking-age economies, and will be discussed in detail below: these are the status, bullion and coin-based economies. The different types of economies have been identified with, and are characterised by, the use of different types of money.

In a status economy, large objects made from silver or gold, such as brooches, arm rings or neck rings, are exchanged as gifts. In a bullion economy, these ornaments, as well as ingots, both whole and fragmentary, along with cut coins, which are collectively known as hacksilver, are used for their bullion weight and precious metal content and are used for trade and exchange. The coin-based economy is where coins are used and trusted at their face value rather than their inherent metal content.

Broadly-speaking there are two schools of thought on the monetisation of the Viking-age economy. The first school of thought sees the Viking-age economy progressing from a status economy, through a bullion phase, and finally into a coin-based economy. There are periods of transition where both status objects and bullion in the form of hacksilver are found together, and where bullion and coins are found together, but the overall linear trend is towards coins.² The second school reflects a much more anthropological model in which the three types of economy coexist simultaneously in different economic spheres; different types of money are used to pay for different types of goods and services. In this model, different types of money

Hoardings', in *Land, Sea and Home: Proceedings of a Conference on Viking-Period Settlement at Cardiff, July 2001*, ed. by J. Hines, A. Lane and M. Rednap (Leeds: Maney, 2004), pp. 177-87; J. Graham-Campbell, 'The Dual Economy of the Danelaw: The Howard Linecar Memorial Lecture 2001', *British Numismatic Journal*, 71(2001), 49-59; J. Graham-Campbell, 'The Viking-Age Silver Hoards of Ireland', in *Proceedings of the Seventh Viking congress, Dublin, 1973*, ed. by B. Almqvist and D. Greene (Dublin: Royal Irish Academy, 1976), pp. 39-74; and work by various authors in *Silver Economy in the Viking Age*, ed. by J. Graham-Campbell and G. Williams (Walnut Creek (CA): Left Coast Press, 2007) and B.C. Cook and G. Williams (eds) *Coinage and History in the North Sea World, c. AD 500-1200: Essays in Honour of Marion Archibald* (Leiden: Brill, 2006).

² Hårdh, *Silver in the Viking Age*, p. 182.

objects are found together where the different economies intersect; for example status objects such as brooches can be found with hack silver or with coins. The hoards of mixed categories of monetary objects therefore represent social and not chronological differences.³ The two schools of thought are shown diagrammatically in Figures 5.1 and 5.2 below.

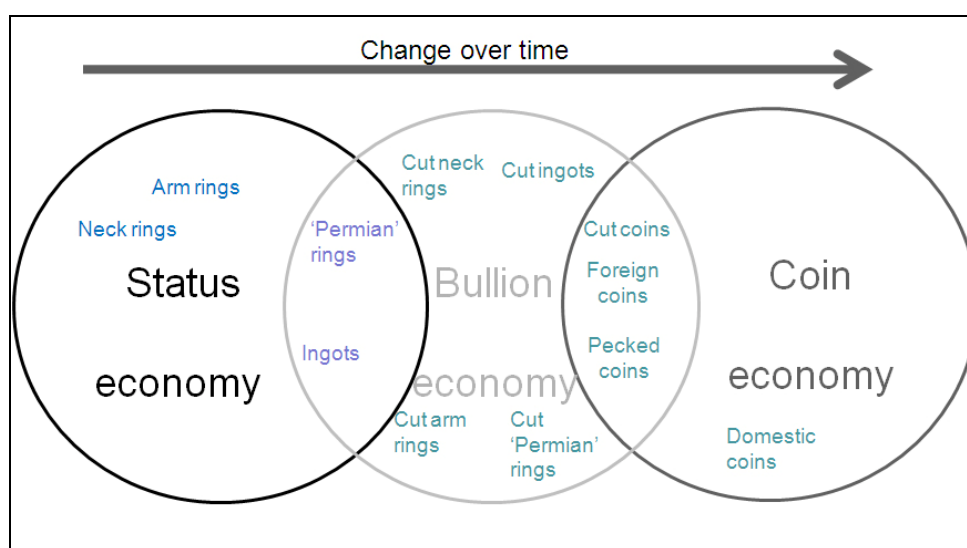


Figure 5.1 The linear model for Viking-age economies whereby the status economy is replaced by a bullion economy, and then a coin-based economy, with some overlap in each transition. Key: **special purpose money**, **transitional**, **general-purpose money**.

The linear model for the development of Viking-age economies proposes that at first a status economy exists in a Viking society, in which ornaments such as neck rings and arm rings, and perhaps brooches or other jewellery, are used as decorative objects as well as the storage and display of wealth. This is followed by the transition to a bullion economy in which these ornamental objects are replaced by weight-adjusted ornaments such as 'Permian' rings which are decorative items which were made to a set weight, or series of set weights, which meant

³ M. Gaimster, 'Money and Media in Viking Age Scandinavia', in *Social Approaches to Viking Studies*, ed. by R. Samson (Glasgow: Cruithne Press, 1991), p. 119.

that not only were they status objects wearable and a store of wealth, but also that this store of wealth was standardised, and the owner or wearer of the rings knew the exact value of their ornaments.⁴ The use of ingots is seen as the next stage in this development as they are standardised weights and values of metal but lack the ornamental function of jewellery. The bullion economy is identified by the presence of hacksilver which can be made from cut ornaments, cut ingots or cut coins. It is the use of cut coins as hacksilver which heralds the start of a transitional phase towards a coin-based economy. This is followed by the use of coins which were not produced by the Viking-age society using them, which have been classified here as foreign coins. In the transitional phase both cut and foreign coins are often tested to judge their silver quality and fineness. This testing can take the form of pecking, bending or edge-nicking, all of which are discussed below. Finally, the leaders in the Viking society realise the benefits of a coin-based economy and begin to produce their own domestic currency in the form of coins, which will be used by the general population within that society.

⁴ G. Williams, 'Kingship, Christianity and Coinage: Monetary and Political Perspectives', in *Silver Economy in the Viking Age*, ed. by J. Graham-Campbell and G. Williams (Walnut Creek: Left Coast Press, 2007), pp. 182.

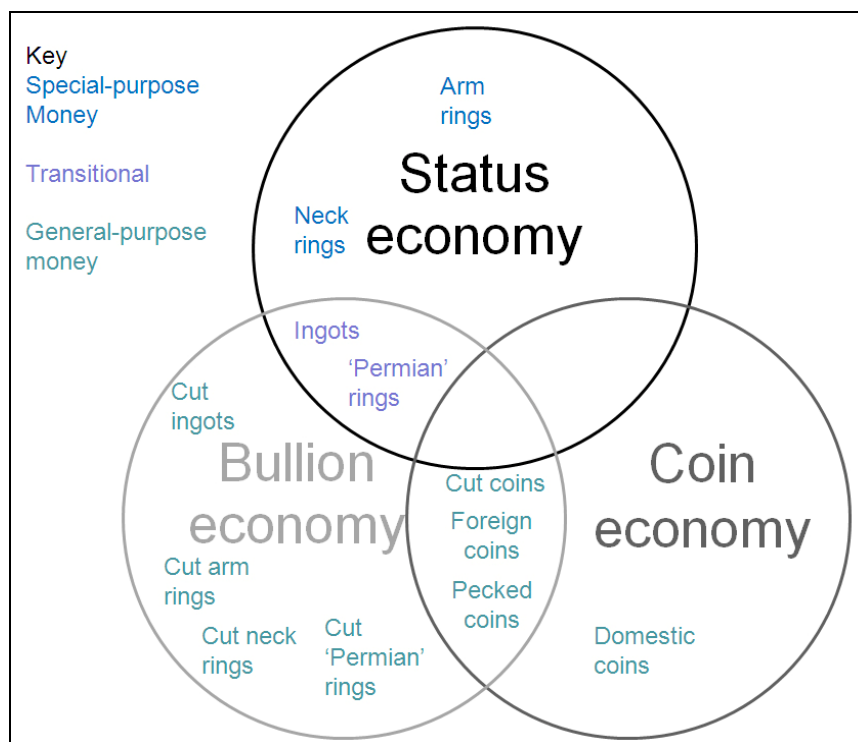


Figure 5.2 The simultaneous model for Viking-age economies, in which different economies coexist and are used for different social and economic functions, with some overlap in these functions.

The second model for Viking-age economies is shown in Figure 5.2 above. This model does not represent a linear development from a status to a coin-based economy. As with the linear model above, finds of ornaments such as arm rings or neck rings show the presence of a status economy. However, where the presence of ingots and 'Permian' rings or other weight-adjusted ornaments was seen in the linear model as evidence for the transition from the status to the bullion economy, here these objects represent the intersection of the two types of economy at the same time. In the simultaneous model, all three economic spheres exist together, but the different types of money found in hoards or as single finds represent the different uses of money for different types of goods and services, rather than a chronological difference. For example, arm rings may be used to pay rewards to loyal followers, whilst

hacksilver was used in commercial transactions with traders from outside of the kingdom or area.

In these diagrams, various types of monetary objects are described and placed within the economic spheres. The combinations of these objects are what we would expect to see should the model of Viking-age economy actually be represented in the evidence. The process of monetisation is one which is generally viewed as the process of change from a status to a coin-based economy. In anthropological terms this is seen as the transition between special-purpose social forms of exchange such as gifts and awards for fealty, to a general-purpose commercially-driven use of money.⁵ In particular the linear model ascribes coins a revolutionary power for social change, and assumes that once coins are introduced in a society, they will inevitably be adopted.⁶ There is an evolutionary assumption in this theory, whereby the gift economy turns into the coin-based economy, rather than the two (or more) economic spheres which co-exist and are used for different purposes. The second model of Viking-age economy identifies the same spheres of economies but instead of seeing these as a linear progression from status to coin-based economy, posits that all three exist concurrently, but with different forms of money, such as coins, ornaments and hacksilver being used in different spheres for different purposes.⁷

The rest of this chapter will examine the types of economy in detail, looking at the theoretical basis for each, and comparing it with the evidence from Viking York. The questions asked of

⁵ B. Maurer, 'The Anthropology of Money', *Annual Review of Anthropology*, 35 (2006), 17.

⁶ J. Parry and M. Bloch, 'Introduction: Money and the Morality of Exchange', in *Money and the Morality of Exchange*, ed. by J. Parry and M. Bloch (Cambridge: Cambridge University Press, 1989), p. 3.

⁷ M. Gaimster, 'Money and Media in Viking Age Scandinavia', in *Social Approaches to Viking Studies*, ed by R. Samson (Glasgow: Cruithne Press, 1991), pp.119.

the data from Viking York are whether there is a clear linear progression which can be seen from a status economy to a coin-based one, and if there is not, can different economic spheres be identified? Finally it will be asked what the use of money in the Northern Danelaw can tell us about Viking society and the kings who ruled it.

Traditionally, when money or the circulation of money in a society is mentioned, it is coinage that is being discussed. The western view and understanding of money has been shaped by the tradition of coin-use stretching back to the ancient Greeks of Lydia in about 550 BC and continued throughout the Roman, medieval and modern periods. At its simplest, money is a tool for exchange which can take any form, from cowrie shells to credit cards, by way of metal ingots, salt bars, stone rings and paper money.⁸ Coins were ideal units of money, it is argued, because they were made of a stable material which does not corrode easily, and were made in convenient sizes for transportation: coins were precious, durable and portable.⁹ Yet coins are not the only form of money, and the term money will here be used to refer to objects involved in both economic and social transactions such as ornaments and hacksilver. The Vikings in York provoke interesting questions on the adoption and use of coins, and the process which is commonly called monetisation. Here, the term monetisation will be used to describe the type and frequency of monetary exchange in a kingdom, not just the level of coin-use in its narrowest definition.¹⁰

⁸ J. Cribb, *Money: From Cowrie Shells to Credit Cards* (London: British Museum Press, 1986), pp. 23, 27, 30-2, 42-5.

⁹ Smith, *Wealth of Nations*, p. 28.

¹⁰ See Eagleton and Williams, *Money: A History*, pp. 200-11, for a wider anthropological understanding of the meaning of money.

The evidence for monetary circulation and monetisation in the Viking Kingdom of York is in the form of hoards, single finds, and from archaeological investigations. The hoards which have been studied for this chapter reach beyond the narrow confines of the coin-only hoard and include silver or gold hoards from the Danelaw areas and beyond. Similarly, the single-find evidence includes coins as well as other objects such as ornaments and ingots made of silver or gold. This information is derived from the *Checklist of Coin Hoards* and the *Early Medieval Corpus of Coins*, both of which are hosted and updated by the Fitzwilliam Museum, Cambridge.¹¹ These two resources are compiled from older publications on hoards, such as Thompson's *Inventory of British Coin Hoards*, the annual Coin Register in the *British Numismatic Journal*, and finds reported to the Museum.¹² Both hoards and single-finds of coins and other objects are also recorded by the Portable Antiquities Scheme in its database and published in its Annual Reports.¹³ These are supplemented by more detailed surveys and studies of groups or individual hoards or finds, especially those discovered before the advent of the Portable Antiquities Scheme in 1996.¹⁴ The data for both hoards and single finds of coins have been used for the distribution maps in Chapter 4, and the hoards are listed in the Gazetteer in Appendix IV.

¹¹ Fitzwilliam Museum, *Corpus of Early Medieval Coin Finds*; Fitzwilliam Museum, *Checklist of Coin Hoards*, available at <http://www.fitzmuseum.cam.ac.uk/dept/coins/projects/hoards/> [accessed on 14 January 2011].

¹² J.D.A. Thompson, *Inventory of British Coin Hoards, AD 600-1500* (Oxford: Oxford University Press, 1956).

¹³ Available at <http://www.fitzmuseum.cam.ac.uk/dept/coins/projects/hoards/> [accessed on 10 July 2011]; available at <http://www.fitzmuseum.cam.ac.uk/dept/coins/emc/> [accessed on 10 July 2011]; Bland, *Treasure Annual Report 1998 – 1999*; R. Bland and L. Voden-Decker (eds) *Treasure Annual Report 2000* (Department for Culture, Media and Sport: London, 2002); R. Bland and L. Voden-Decker (eds), *Treasure Annual Report 2001* (Department for Culture, Media and Sport: London, 2003); A. Gannon, L. Voden-Decker, and R. Bland (eds), *Treasure Annual Report 2002* (Department for Culture, Media and Sport: London 2004); A. Gannon, L. Voden-Decker, and R. Bland (eds), *Treasure Annual Report 2003* (Department for Culture, Media and Sport: London 2004); F. Hitchcock (ed.), *Treasure Annual Report 2004* (Department for Culture, Media and Sport: London 2006); C. Barton and F. Hitchcock (eds), *Treasure Annual Report 2005/6* (Department for Culture, Media and Sport: London 2008); M. Lewis (ed.), *Treasure Annual Report 2007* (Department for Culture, Media and Sport: London 2009).

¹⁴ See Hoards Gazetteer, Appendix IV for bibliographies of individual hoards.

Identifying a Status Economy in York

In the two models of Viking Age money discussed above, the status economy is identified by the presence of ornaments which are exchanged as gifts for their social, rather than their economic, value. It is argued that in the beginning of the Viking age ornamental silver objects were exchanged as gifts to loyal jarls or warriors in return for their fealty, or given by leaders of clans or war bands to other leaders in diplomatic exchanges, marriage treaties, as tribute, or used as payment for wergild or similar social infractions.¹⁵ Such exchanges are recorded in sagas, and poetry such as the gifts of rings that are given by Hrothgar to his followers in *Beowulf*.¹⁶

Viking-age objects that have been classed as status objects include large items of precious metal, usually in the form of decorative personal ornaments such as bracelets, buckles, pendants, arm or neck rings and large ‘thistle-head’ brooches.¹⁷ These have been commonly found in hoards in Scandinavia, but rarely as single finds, which has led to the view that these objects represented storage of wealth, which is one of the key functions of money. This status economy has also been called the display economy due to the decorative nature of the objects, and the way in which they were thought to have functioned as both the storage of wealth and

¹⁵ M. Gaimster, ‘Viking Economies: Evidence from the Silver Hoards’, in *Silver Economy in the Viking Age*, ed. by J. Graham-Campbell and G. Williams (Walnut Creek (CA): Left Coast Press, 2007), p. 127; M. Gaimster, ‘Money and Media’, p. 113

¹⁶ Williams, ‘Kingship, Christianity and Coinage’, p.182; G.N. Garmonsway and J. Simpson, *Beowulf and its analogues* (Publisher: London, 1968), ll.1020-1050, ll.1866-1880.

¹⁷ See Huxley hoard catalogue for sample of objects, J. Graham Campbell and J. Sheehan, ‘The Catalogue’, in *The Huxley Viking Hoard: Scandinavian Settlement in the North West*, ed. by J. Graham-Campbell and R. Philpott (Liverpool: National Museums Liverpool, 2009), pp. 51-7; see the classic image of Cuerdale hoard in Graham-Campbell, *Viking Treasure*, p. viii; Bland and Voden-Decker, *Treasure Annual Report 2001*, p.34, number 45.

the conspicuous display of that wealth.¹⁸ These ornaments could both function as wearable items which conspicuously displayed not only wealth, but also contained a social meaning, such as the number of times a warrior had been rewarded by his lord.

This status economy is elusive in the context of the Viking Kingdom of York. The Northumbrian kingdom which preceded the Vikings minted its own coins, in the form of the highly debased stycas. These coins enjoyed a wide circulation north of the Humber and west of the Pennines, and throughout the eastern coast of England.¹⁹ The last stycas were issued in c.867 and there was a break until at least c.895 before minting at York resumed.²⁰ The new coins at York were completely different to the small thick stycas made from base metal which had circulated before, as can be seen in Figure 5.3 below. It was not only the thickness and diameter of the coins which had changed, but also the metal content, both of which would substantially change the way in which coins were minted. This means that even if the men who had made stycas at the York mint were still alive and working, their skills were probably different to what was needed to strike these new coins modelled upon contemporary Anglo-Saxon pennies. The hiatus in minting at York would probably not have prevented coins circulating inside the old kingdom of Northumbria. Evidence from medieval England shows that coins could circulate for decades; the recoinages of the twelfth and thirteenth-centuries

¹⁸ Williams, 'Kingship, Christianity and Coinage', p. 178; J. Graham Campbell, 'Some Reflections on 'Silver Economy in the Viking Age'', in *Silver Economy in the Viking Age*, ed. by J. Graham-Campbell and G. Williams (Walnut Creek: Left Coast Press, 2007), pp. 216; J. Graham Campbell, 'The Coinless Hoard', in *Coins and Archaeology*. Medieval Research Group: Proceedings of the First Meeting at Isegran, Norway, 1988, British Archaeological Reports, International Series, 556, ed. by H. Clarke and E. Schia (Oxford: BAR, 1989), pp. 54-5.

¹⁹ See Chapter 4, pp. 207-9.

²⁰ C.S.S. Lyon, 'A Reappraisal of the Sceatta and Styca Coinage of Northumbria', *British Numismatic Journal*, 28 (1955-7), 227-42; J. Booth, 'Sceattas in Northumbria', in *Sceattas in England and on the Continent: The Seventh Oxford Symposium on Coinage and Monetary History*, ed. by D. Hill and D.M. Metcalf, British Archaeological Reports, British Series, 128 (Oxford: BAR, 1984), pp. 71-112; Blackburn, 'Currency Under the Vikings, Part 2', 205.

occurred irregularly, usually between twenty and forty years.²¹ Therefore there is no reason to doubt that the residents of York would be familiar with coins despite the lack of newly-minted coins. This familiarity and circulation of coins does not, however, explain the lack of a status economy, and the finds associated with it, in Viking-age York.



Figure 5.3 The last Northumbrian and the first Viking coins of York: a) Obverse and reverse of a styca of the last king of the Kingdom of Northumbria Osberht (849/50-867), and b) obverse and reverse one of the first pennies to be made under the Vikings at York, Siefred (c.895-900).²²

It was the Viking invaders who were more likely to be unfamiliar with coins as they were not minted on a large scale in Scandinavia until the late-tenth century, except for some small issues of coins from Hedeby and Ribe in the ninth century.²³ Studies on Scandinavian hoards have looked at assemblages of silver as indications of a status economy where ornaments were used as both display items and for storage of wealth, and were given as gifts by leaders to warriors to ensure fealty.²⁴ However, the evidence for the Viking-age in England does not seem to show the presence of a similar status economy. In Figure 5.4 below it can be seen that the majority of non-numismatic finds of the Viking age are silver. There are concentrations of

²¹ B.J. Cook, 'Crimes Against the Currency in Twelfth- and Thirteenth-Century England', *Bulletin of the John Rylands Library of Manchester*, 83 (2001), 53.

²² EMC coins: 1004_0378 obv and rev; 1029_0204 obv and rev.

²³ B. Malmer, 'South Scandinavian Coinage in the Ninth Century', in *Silver Economy in the Viking Age*, ed. by J. Graham-Campbell and G. Williams (Walnut Creek (CA): Left Coast Press, 2007), p. 22.

²⁴ Especially Hårdh, *Silver in the Viking Age* for Scandinavia and J. Sheehan, 'Ireland's Early Viking-Age Silver Hoards: Components, Structure, and Classification', in *Vikings in the West*, ed. by S. Stummann Hansen and K. Randsborg (*Acta Archaeologica*, 71: 2000), 49-63, for Ireland.

Viking-age objects north of the Humber, in East Anglia and in the Pennines, although the distribution is not as clearly concentrated on the east of England as the coin single-finds seen in Chapter 4.

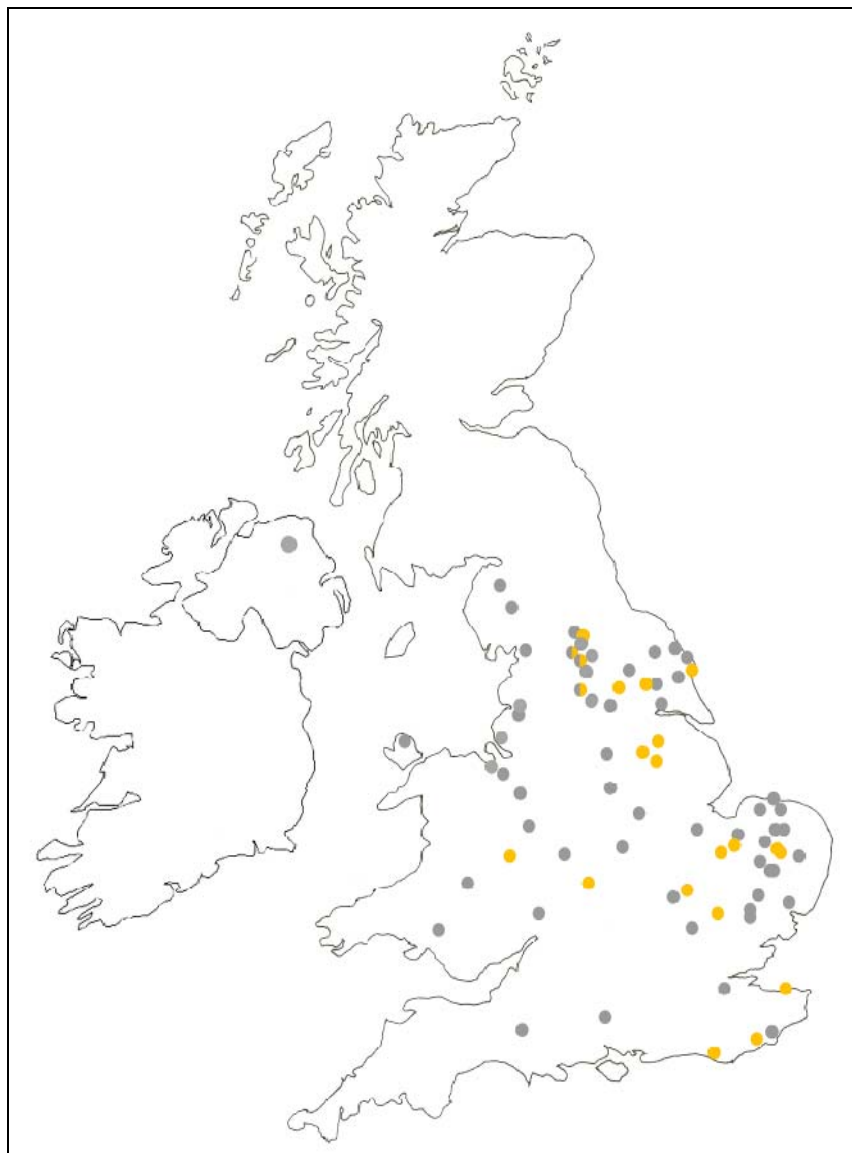


Figure 5.4 Map showing finds of non-numismatic Viking-age ornaments and ingots from hoards and single finds. The yellow dots represent gold objects and the grey dots show silver objects, dots with both colours show that both gold and silver were found at the site. The data is from the Portable Antiquities Scheme over the last ten years.²⁵

²⁵ Annual Treasure Reports, cited above are available at: <http://finds.org.uk/news> [accessed on 30 August 2011].

There is little evidence of ornament-only hoards in England, even in areas where large numbers of Viking single coins have been found. The coinless hoards which have been found, such as Huxley (Cheshire), Orton Scar (near Appleby, Cumbria) and Flusco Pike (near Penrith, Cumbria), are thought to be early tenth-century rather than ninth-century deposits.²⁶ This would indicate that the status economy did not occur exclusively at the beginning of the Viking-age in England, but throughout. Scholars such as Gaimster have questioned the reliability of Norse and Anglo-Saxon poems and the references within them to interpret ornaments and hoards in which they are found as evidence of a status economy.²⁷ The anthropological narrative of the gift, famously expounded by Mauss, and often quoted in early medieval literature, does not explain the complexities of exchange in the Viking-age economy which may never have functioned solely using status objects such as these.²⁸

The conclusions which can be drawn from the lack of ninth-century hoards and the likelihood of a continuing presence of coins in circulation are that the early Viking Kingdom of York did not function using only a status economy. Instead both native Northumbrians and any new settlers to the Kingdom used other means of exchange. They may have made, used and saved ornaments for some exchanges, but these objects did not form their main source of money. But what was this form of money, and did the Vikings start using coins immediately or did

²⁶ Graham-Campbell and Sheehan, 'The Catalogue', pp. 51-7; E. Birley, 'The Orton Scar Find, and Thomas Revely of Kendal', *Transactions of the Cumberland & Westmoreland Antiquarian and Archaeological Society*, 2nd ser., 64, (1964), 81-85; R. Cramp, 'The "Viking Type" Penannular Brooch and Torc from Orton Scar', *Transactions of the Cumberland & Westmoreland Antiquarian and Archaeological Society*, 2nd ser., 64 (1964), 86-9; C. Richardson, 'A Find of Viking-Period Silver Brooches and Fragments from Flusco, Newbiggin, Cumbria', *Transactions of the Cumberland and Westmoreland Antiquarian and Archaeological Society*, 96 (1996), 35-44.

²⁷ M. Gaimster, 'Viking Economies', p. 126.

²⁸ J.L. Nelson, 'Introduction', in *The Languages of Gift in the Early Middle Ages*, ed. by Davies, W., and P. Fouracre (Cambridge: Cambridge University Press, 2010) pp. 1-4.

they use of bullion in the form of hacksilver as their main means of exchange in the period immediately after the invasion of the Vikings in York?

The Bullion Economy

The move from a status economy to a bullion economy is generally seen as part of the process of monetisation in which hacksilver gradually replaced the use of ornaments as status objects and gifts.²⁹ The status economy is seen as a sphere in which objects are used only for special kinds of payments, such as gifts, rewards or other types of social, rather than commercial, transactions.³⁰ General-purpose money such as coins, which can purchase a range of goods and services, is seen as the great leveller of value, in which uniform coins can buy almost anything. The next phase of economic development in the Viking age is described as the bullion, mixed or dual economy.³¹

Items of hacksilver can include cut ornaments, cut ingots or cut coins, and the level of fragmentation of these items can be low, with large pieces of recognisable objects remaining, or fragmentation can be high, with small fragments mean the objects from which they were cut are not always identifiable. In Sweden and Denmark, Hårdh has intensively studied silver hoards and identified an evolutionary transformation from a status economy via a hacksilver phase to a coin-based economy.³² Her work has revealed complexities amongst these Scandinavian economies, and she argues that the structure and composition of hoards are

²⁹ Williams, 'Kingship, Christianity and Coinage', p. 178; Graham Campbell, 'Dual Economy of the Danelaw', 59.

³⁰ B. Maurer, 'The Anthropology of Money', 20.

³¹ Graham-Campbell, 'The Coinless Hoard', p. 53; Williams, 'Kingship, Christianity and Coinage', p. 178.

³² Hårdh, *Silver in the Viking Age*, p. 182.

related to, and can be used to determine, the monetary function of the objects within. An interesting feature of Scandinavian hoards which Hårdh argues to be a transitional stage between status and bullion economies, is the presence of weight-adjusted ornaments, the so-called 'Permian' arm rings. These were made to a range of standard weights and functioned both as ornaments and also contained a standard value.³³ These standards varied throughout Scandinavia and Russia. Hårdh's work has shown that Permian rings had very limited geographical circulations, which implied they were used not as a general means of exchange but for local and specialised payments, such as gifts, ransoms, dowries or other social payments, much as normal ornaments which were not weight-adjusted had done. Both ornaments and 'Permian' rings were used for social payments and did not necessarily have wide circulations as they were used to cement close inter-community relationships. Williams likens weight-adjusted ornaments like 'Permian' rings to similar weight-adjusted ornaments found in the British Isles such as the early medieval Scottish and Irish 'ring money', to modern deluxe ornaments such as a designer watch; the fact that other people know exactly how much your ornament is worth is part of its value.³⁴ However there have been few finds of weight-adjusted ornaments in Northern Danelaw contexts. Instead the common types of ornaments which are found in British contexts are arm rings of a different sort in terms of size, construction and decoration from the 'Permian' rings. The 'thistle-head' brooch is typical and even diagnostic of Viking hoards and it has been argued that the large decorative 'thistles'

³³ B. Hårdh, 'Oriental-Scandinavian Contacts on the Volga, as Manifested by Silver Rings and Weight Systems,' in *Silver Economy in the Viking Age*, ed. by J. Graham-Campbell and G. Williams (Walnut Creek: Left Coast Press, 2007), p.144.

³⁴ Williams, 'Kingship, Christianity and Coinage', p. 182.

functioned to use as much silver as possible in the construction of the brooch, thus displaying as much wealth as possible, but these are not made in standard sizes.³⁵

There are, however, substantial numbers of Viking-age ingots found in Northern Danelaw contexts. It can be argued that ingots are slightly removed from the special-purpose money of ornaments, and perhaps the next step from weight-adjusted ornaments on the progress towards coin-use.³⁶ These ingots which are found in Britain, some made in gold, but mainly in silver, appear to have been made in standard sizes. Whilst there are no transitional weight-adjusted ornaments for the Northern Danelaw, these ingots appear to have been made in standard weights. This development of weight adjustment of objects which cannot be worn as ornaments can be seen as evidence for an economy based upon bullion rather than status objects. However, whilst ingots are found in the Northern Danelaw, they are not confined to any one period from the Viking Kingdom of York, and appear from the late ninth to the late tenth centuries in hoards, as can be seen in Figure Table 5.1 below.

The presence of hacksilver is a widespread phenomenon in Viking-age hoards. There are some hacksilver-only hoards, but these are not as common as hoards containing ornaments or coins in addition to hacksilver. In trying to understand the composition of Irish hoards, Sheehan rebelled against the usual nomenclature of coin and coinless hoards, arguing that to define a hoard by the absence of objects is nonsensical, especially when coins comprise such a

³⁵ Graham Campbell, 'Dual Economy of the Danelaw', 52.

³⁶ G. Williams, 'Hoards from the Northern Danelaw from Cuerdale to the Vale of York', in *Vikings in the North-West*, ed. by J. Graham-Campbell and R. Philpott (Liverpool: National Museums Liverpool, 2009), pp. 76-9.

small proportion of the total weight of silver found in Irish hoards.³⁷ He also argued that coins were not used as coins but as bullion in Viking age Ireland and other non-coin economies, an argument that has been refuted certainly for the Isle of Man.³⁸ Despite his radical viewpoint on coins in hoards, Sheehan has done extensive work in the vein of Hårdh on the detail of hoard contents.³⁹ Sheehan divides the whole objects category into ornaments and ingots. Hacksilver is also divided in terms of what the object originally was, into hack ornaments, hack ingots and coins. These divisions have been followed in Table 5.1 below to see whether the classification of objects in hoards can reveal the structure of the Viking economy in York. Others have suggested similar divisions for hacksilver made from coins, creating separate categories for whole coins, and subdivisions according to whether the coin was domestic or foreign in manufacture.⁴⁰ The subdivision of hacksilver into its various components certainly illuminates the range of hoard types, and has led to arguments that the type of hacksilver in hoards reflects different spheres of exchange.⁴¹ Yet despite these complex theories, the presence of hacksilver is still generally seen as indicative of a transitional phase from an ornament-based status economy to a coin-based economy, rather than an economy in itself where different kinds of money were used to purchase different types of goods and services.

³⁷ Sheehan, 'Form and Structure of Viking-Age Silver Hoards', p. 150.

³⁸ J. Graham-Campbell, 'Some Reflections on 'Silver Economy in the Viking Age'', in *Silver Economy in the Viking Age*, ed. by J. Graham-Campbell and G. Williams (Walnut Creek: Left Coast Press, 2007), pp. 219-20.

³⁹ Sheehan, 'Form and Structure of Viking-Age Silver Hoards', pp. 149-162; Sheehan, 'Evidence of the Hoards', pp. 177-87; Sheehan, 'Ireland's Early Viking-Age Silver Hoards', 49-63.

⁴⁰ Gaimster, 'Viking Economies', pp. 124-8.

⁴¹ Gaimster, 'Money and Media', p. 120.

The table below shows details of coinless and coin hoards containing non-numismatic material which were deposited between c.865 and c.970 in the Viking Kingdom of York.⁴² In the linear model of monetisation, we would expect to see a pattern of hoards containing only whole ornaments, followed by ingots, hacksilver, foreign coins and then domestic coins. This linear theory sees the use of ornaments as part of a status economy, the transitional use of weight-adjusted ornaments and ingots, then the use of hacksilver cut from ornaments, ingots and coins as part of the bullion economy. The transition to the coin-based economy is heralded by the use of foreign coins for their metal value and familiar designs, and completed with the sole use of coins produced within the kingdom, here called domestic coins. It has been shown above that there was no real status economy in Northumbria before or after its annexation by the Vikings, and although ornaments were hoarded in combination with other forms of precious metal they do not seem to have been hoarded alone, or used as a primary means of exchange in the Viking Kingdom of York. In looking at the table below it can be seen that there is no clear chronological progression in the use of ingots, types of hacksilver, or coins found in these hoards. This shows that either the Kingdom of York did not follow a linear path towards monetisation, or that the model, propounded by Sheehan and Hårdh, which is based upon the identification of economic behavior from the composition of hoards is flawed.⁴³

⁴² These parameters have been chosen as the first Viking invasion of York was c. 865 and although the last Viking king of York died in 954, many Viking York coins are found in later hoards. See Chapter 4 for further discussion.

⁴³ Hårdh, *Silver in the Viking Age*; Sheehan, 'Ireland's Early Viking-Age Silver Hoards', pp. 49-63.

Table 5.1 Table showing the composition of Viking-age hoards containing hacksilver from the Northern Danelaw.

Hoard	Location	Deposit date	Whole ornaments	Whole ingots	Cut ornaments	Cut ingots	Foreign coins	Domestic coins
York Coney Street	Yorks.	c.865					X	
Lower Dunsforth	N. Yorks.	c.875					X	
Gainford	Durham	c.875					X	
Beeston Tor	Notts.	c.875	X				X	
Kirkoswald	Cumbria	c.850	X				X	
North Yorks area	N. Yorks.	c.875		X	X		X	
Huxley	Ches.	c.875-925	X	X	X	X		
Nottingham	Notts.	c.901					X	
Stamford	Lincs.	c.901					X	X
Cuerdale	Lancs.	c.905-10	X	X	X	X	X	X
York Walmgate	Yorks.	c.910-15					X	X
Dean	Cumbria	c.915					X	
Chester St John's	Ches.	c.920					X	X
Bossall/Flaxton	Yorks.	c.925			X		X	X
Harkirke	Lancs.	c.925		X		X	X	X
Penrith	Cumbria	c.925		X	X	X	X	X
Thurcaston	Leics.	c.925					X	X
Goldsborough	N. Yorks.	c.925-30					X	
Vale of York	N. Yorks.	c.928	X	X	X	X	X	X
Scotby	Cumbria	939-40?					X	
Warton (Carnforth)	Lancs.	c.950			X		X	
Chester Eastgate	Ches.	c.960					X	
Chester Castle								
Esplanade	Ches.	c.965		X	X		X	X
Tetney	Lincs.	c.970					X	X
Flusco Pike	Cumbria	c.970			X	X		

If the hoards in the Northern Danelaw do not represent the chronological development of a status to a bullion and then coin-based economy, then how else can they be interpreted? The majority of these hoards are located to the west of the Pennines, which means it could be

argued that that they represent a different geographical sphere of economy from the heartlands of the Viking Kingdom of York based in Yorkshire and the Five Boroughs. The presence of Irish-style objects such as the ‘thistle’ head brooches found in the Penrith and Goldsborough hoards, and the broad-band style arm rings found in Huxley, have been presented as evidence that these were hoards of wealth brought to England by Irish Vikings who had not had contact with coin economies and were still using and storing their wealth in objects.⁴⁴

The presence of a bullion economy can be seen in the Northern Danelaw in the composition of hoards, in those containing hacksilver and ingots, and also in the treatment of the objects within the hoard and finds of objects used to test them. There is a large corpus of Viking age coin weights found in Britain which indicates that coins and bullion were weighed.⁴⁵ It has always been assumed that the weights were used to measure hacksilver, but they could equally have been used to weigh coins to test whether they were the correct weight and were the real thing. These weights have been investigated and it has been argued that the weights conform to several weight standards which are known from historical sources.⁴⁶ However, the range of weight in these objects means that they were either not made very precisely, or that they were not made to a standard weight system.⁴⁷ The fact that they range so much in weights suggests that Viking weights were not being used to measure standard weights of coins, but may have

⁴⁴ G. Williams, ‘Some Reflections on ‘Silver Economy in the Viking Age’’ in *Silver Economy in the Viking Age*, ed. by J. Graham-Campbell and G. Williams (Walnut Creek: Left Coast Press, 2007), pp. 75-7; J. Sheehan, ‘The Huxley Hoard and Hiberno-Scandinavian Arm-Rings’ in *The Huxley Viking Hoard: Scandinavian Settlement in the North West*, ed. by J. Graham-Campbell and R. Philpott (Liverpool: National Museums Liverpool, 2009), pp. 58-60.

⁴⁵ The corpus is listed in Williams, ‘Anglo-Saxon and Viking Coin Weights’, *British Numismatic Journal*, 69 (1999), 19-36.

⁴⁶ Hårdh, ‘Oriental-Scandinavian Contacts on the Volga’, p. 142; M.M. Archibald, ‘Two Ninth-Century Viking Weights found near Kingston, Dorset’, *British Numismatic Journal*, 68 (1998), 18.

⁴⁷ Confusingly, Williams argues both that there was a weight system in Williams, ‘Anglo-Saxon and Viking Coin Weights’, 33, and that the coin weights are not made to a set of weight standards in Williams, ‘Kingship, Christianity and Coinage’, p. 179.

been personal weights which the owner used for all weighing and therefore understood the value of silver according to his system. Some weights were embellished with decorative pieces of lead or Anglo-Saxon coins, and this embellishment supports the idea that the weights may have belonged to individuals who carried them to each transaction and personalised their weights to signify ownership and to easily identify the value of each weight in a set.⁴⁸



Figure 5.5 Coins (enlarged size) which have been tested for metal purity: a) Bent coin, with the line of the bend marked by arrows, and b) Pecked coin, with two peck marks highlighted by white circles.⁴⁹

The treatment of silver in the form of testing is present in many objects which have been found in Viking age hoards and can be used to see whether coins were being used as coins, or being tested for use as bullion. The diagnostic feature of British Viking hoards is a form of testing called pecking, which is shown in Figure 5.5b above. This was done to ascertain the fineness and quality of the silver and to check that the object is solid silver throughout, and not base metal with a silver coating to fool people. Pecking is a kind of test mark upon the flat surface silver made by the point of a knife or other sharp object. Other kinds of test marks,

⁴⁸ Williams, 'Anglo-Saxon and Viking Coin Weights', p. 34.

⁴⁹ *EMC* coins of Siefred (c.895-c.900): 1004_0459 rev; 1029_0194 obv.

such as bending of coins and marking the edge of the surface of the silver with a knife are seen across the Viking world.⁵⁰ Pecking, which is unique to British contexts and is found both on coins and on hacksilver, is identifiable from other kinds of test marks by the sprue of metal it leaves raised on the surface of the tested object.⁵¹ It was originally thought that pecking was a practice brought over from Scandinavia by the Vikings, but some of the earliest coins found in Viking Age hoards with hacksilver are not pecked;⁵² the earliest pecked coins are found in the Stamford hoard, deposited c.890.⁵³ Why did this phenomenon not start earlier? Archibald argues that pecking was born from unfamiliarity with some coin types, perhaps those which had designs which differed radically from the familiar Anglo-Saxon and Carolingian types, as some coin types are more pecked than others.⁵⁴ Her research also shows that the *Dominus Deus Rex/Mirabilia Fecit* coins types of Cnut and Siefred are much more heavily pecked than the preceding coins of Siefred which named him as king upon them, and concludes that perhaps the lack of royal name, on the former coins meant they were less trusted and subject to testing more often.⁵⁵ The practice of pecking died out in Viking coin-finds largely in the 920s, although the presence of fewer peck marks on the Swordless St Peter coins than the preceding coins of Siefred and Cnut, shows that the practice was waning before the 920s.⁵⁶ After this date coins appear to have been accepted at their face value without the need to test the quality of the metal.

⁵⁰ Graham Campbell, 'Comparisons and Context', p. 109.

⁵¹ M.M. Archibald, 'The Evidence of Pecking on Coins from the Cuerdale Hoard: Summary Version', in *Silver economy in the Viking Age*, ed. by J. Graham Campbell and G. Williams (Walnut Creek, CA: Left Coast Press, 2007), p. 49.

⁵² Archibald, 'Evidence of Pecking', p. 51.

⁵³ Graham Campbell, 'Dual Economy of the Danelaw', 58.

⁵⁴ *ASC AE*, s.a. 878 [879], *HR Worc*, s.a 879.

⁵⁵ M.M. Archibald, 'The Evidence of Pecking on Coins from the Cuerdale Hoard: Summary Version', in *Silver economy in the Viking Age*, ed. by J. Graham Campbell and G. Williams (Walnut Creek, CA: Left Coast Press, 2007), p. 51.

⁵⁶ Williams, 'Kingship, Christianity and Coinage', p. 197.

Edge nicking is another test which was used to see whether the coin or object was silver all the way through and not just covered with a thin coating of silver, although this practice, unlike pecking, was not confined to the British Isles. Bending was another practice which was used especially on coins to test the softness and purity of the metal, as purer silver is more malleable.⁵⁷ This evidence of measurement and testing shows that at least some Vikings knew how to test and value silver, and it appears from the volume of weights found, that those involved in bullion transactions were able to measure and calculate the value of metal exchanged.

Although pecking was not present in the earliest Viking age hoards such as the Stamford hoard, once it was established as a practice to test metal, pecking was used frequently in the Viking Kingdom of York and in Ireland.⁵⁸ The evidence of pecking dying out in England in hoards deposited in the 920s, along with the evidence of the composition of those hoards, shows that the bullion economy was being supplanted by a coin-based economy by the mid-920s. Only the later hoards which do not contain coins made in the Viking Kingdom of York have either a deposition date after the Kingdom had ended in 954, or are situated on the West of the Pennines far away from the centre of Viking control. The distribution of single-finds of coins made in the Viking Kingdom of York, as discussed in Chapter 4, and seen below in Figure 5.6, was concentrated on the eastern side of the Pennines and it is an acceptable theory

⁵⁷ Ibid., p. 179.

⁵⁸ D.M. Metcalf, 'The Monetary Economy of the Irish Sea Province', in *Viking Treasure from the North West: The Cuerdale Hoard in its Context* (Liverpool Museum: National Museums and Galleries on Merseyside Occasional Papers, 1992), p. 99.

that these western hoards were a product of society not integrated with or directly ruled by the Viking kings.⁵⁹

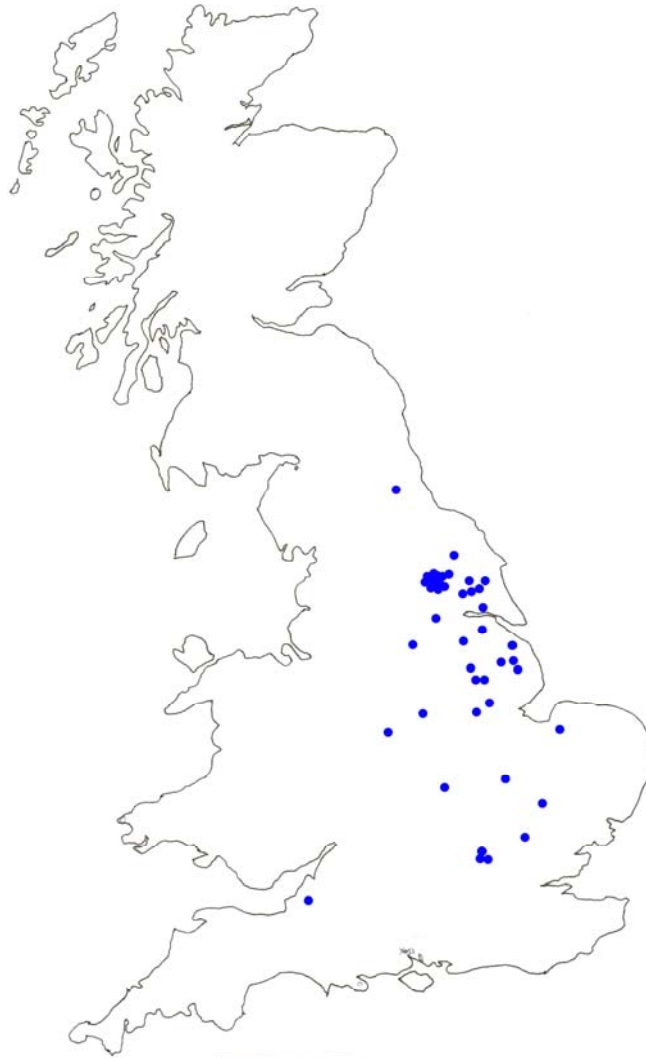


Figure 5.6 Map showing the distribution of single finds of coins which were made in the Viking Kingdom of York.

The study of hoard composition in the Northern Danelaw above has shown that there is no linear progression in the types of hacksilver used and buried in hoards. It has been argued by scholars such as Gaimster that a mixture of types of hacksilver indicates that some types may

⁵⁹ See Chapter 4, p. 200.

have retained a status or special-purpose function of whole ornaments, and that other types such as hack coins or ingots may have been part of a sphere of more general-purpose money which was used for commercial trade.⁶⁰ A modern analogy is perhaps that expensive goods are not paid for in small change, but in notes or by card. In this example small change is theoretically acceptable money, but social and economic norms mean that it is not always suitable for all transactions. So, for example, hacksilver made from ornaments may have been an appropriate means of payment for certain social exchanges such as rewards for loyalty, whereas hacksilver from ingots or coins could have had a wider sphere of payment. Unfortunately, it is impossible to know exactly what these types of hacksilver were used for, as there is neither written evidence nor conclusive archaeological evidence which shows what different types of hack were used for.

In many ways it is the transition between the status economy and the bullion economy which is the important one, not the transition from the bullion to the coin-based one. It is often assumed that a bullion economy is a poor compromise between the status and coin-based economies, which occurred because there was no strong central authority to impose coinage upon its peoples. However, the bullion economy appears to have functioned very well, and coinage was not immediately adopted when Vikings came into contact with it in many cases, leading to the idea that the adoption of coinage was not an evolutionary inevitability, but a choice made by Viking leaders in their new English context. In fact the use of hacksilver as a means of exchange may have functioned to connect York with the Viking Kingdom in Dublin. Coins were not minted in Dublin until the late tenth-century, and it is assumed that the Vikings in Scandinavia were using a mixture of status and bullion economies up to that point. The

⁶⁰ Gaimster, 'Viking Economies', p. 131; Gaimster, 'Money and Media', pp. 116-17.

finds from many Irish hoards of coins made in York testifies to the connections between York and Dublin, and these coins are nearly always found in combination with Anglo-Saxon, Carolingian and Islamic coins and hacksilver into the late tenth-century.⁶¹

But why was there a change in York from the bullion economy which was functioning very well, along with some status economy elements within it? After several decades of the bullion economy, it was not an evolutionary change but some sort of catalyst which prompted the change from the bullion to the coin-based economy.⁶² Coins themselves did not prompt this change in society but are a reflection of the power behind the coins whose decisions created a change in economic and political policy.

The Transition to a Coin-Based Economy

The final stage in the linear theory of Viking-age economic development is a coin-based economy. This is seen in the archaeological record as coin-only hoards. Coins are found in other mixed hoards, but it is assumed that in the contexts in which those hoards were assembled coins were not functioning as coins, but as bullion. The coin-based economy is not just the use of coins produced by other kingdoms as another form of hacksilver, but the production of coins within a kingdom by a central authority, and the use of these coins as the main means of exchange. The change from the bullion to coin-based economy in any society requires sufficient trust in the coins, and in the authority issuing those coins, for them to be

⁶¹ D.M. Metcalf, 'The Monetary Economy of the Irish Sea Province', in *Viking Treasure from the North West: The Cuerdale Hoard in its Context* (Liverpool Museum: National Museums and Galleries on Merseyside Occasional Papers, 1992), pp. 96-9; Also see Gazetteer of Hoards in Appendix IV.

⁶² Parry and Bloch, 'Money and the Morality of Exchange', p. 7; Maurer, 'The Anthropology of Money', 20.

accepted at face value, rather than be subject to testing such as pecking or bending at every transaction.

Generally, in a centrally-issued coinage, the coins issued are set at a fixed denomination. In Anglo-Saxon England and the Viking Kingdom of York this was the penny, in Carolingian Francia it was the denier, and Islamic coins were issued as dirhams. However, due to the production methods in every medieval mint, individual coins could actually weigh more or less than the ideal pennyweight of silver. These differences are shown in Figures 5.7 and 5.8 below, in which a sample of seventy-five Anglo-Saxon and Viking coins was taken from the *Early Medieval Corpus*. The coins of Edmund, have an average weight of 1.2g, which was the usual weight standard for Anglo-Saxon coins of the tenth century. Yet even in this coin type which was managed centrally by the Anglo-Saxon government, there is a wide range of weights to be found for these coins. The heaviest coin in this sample is 1.66g and the lightest is 1.08g which is a weight range of 0.58g. This amount of variation in the coins represents the range of weights within which a coin was deemed an acceptable standard to leave the mint and go into general circulation.

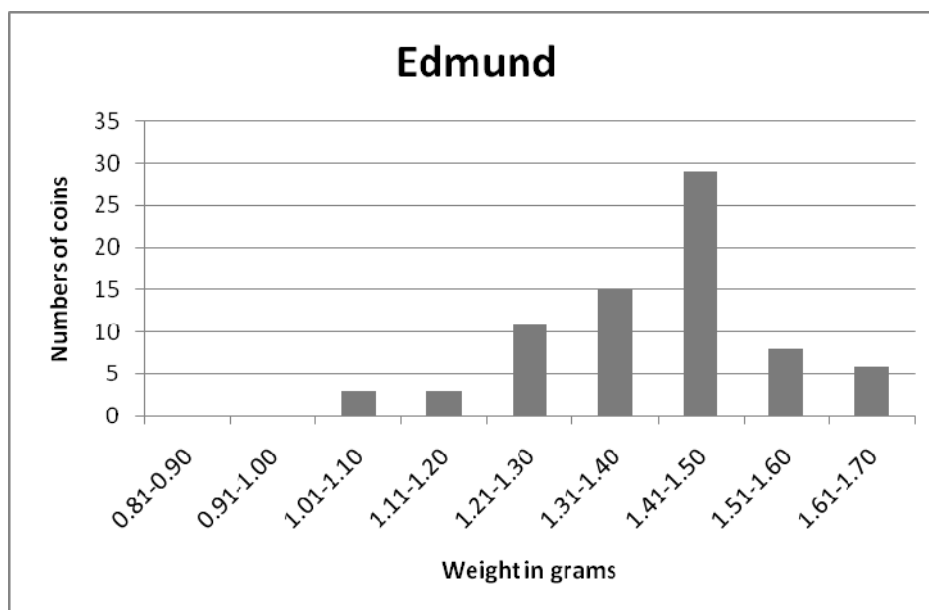


Figure 5.7 Chart showing the weight distribution of a sample of Anglo-Saxon coins of Edmund (939-46). This shows the range of coin weights which were deemed acceptable for this coin type.

The coins issued by the Vikings in York showed a similar range of weights, which would indicate that the coins which left the mint were weighed and the quality was measured before they were put into circulation. The Swordless St Peter coins, shown in Figure 5.8 below, vary in weight from 0.84g to 1.46g, with an average weight of 1.2g. These weights are slightly lower than the Anglo-Saxon standard, as Viking coins were produced to the standard which was in use in Anglo-Saxon coinage before Alfred reformed his coins and raised the weight standard in c.880.⁶³ Thus the difference in the weights does not imply an inferiority of the Viking coins, merely that they were produced to a difference weight standard. The range between the lightest and heaviest weights would indicate whether the control of the York mint under the Vikings was as strict and organised as in Anglo-Saxon mints. The range of weights is 0.62g which is only marginally greater than the acceptable weight range for the Anglo-

⁶³ Blackburn, 'Currency Under the Vikings, Part 1', 21.

Saxon coins. This demonstrates that although the Viking and Anglo-Saxon coins were made to different weight standards, the variation of weights for individual coins within each type had similar levels of deviation from the average coin weight.

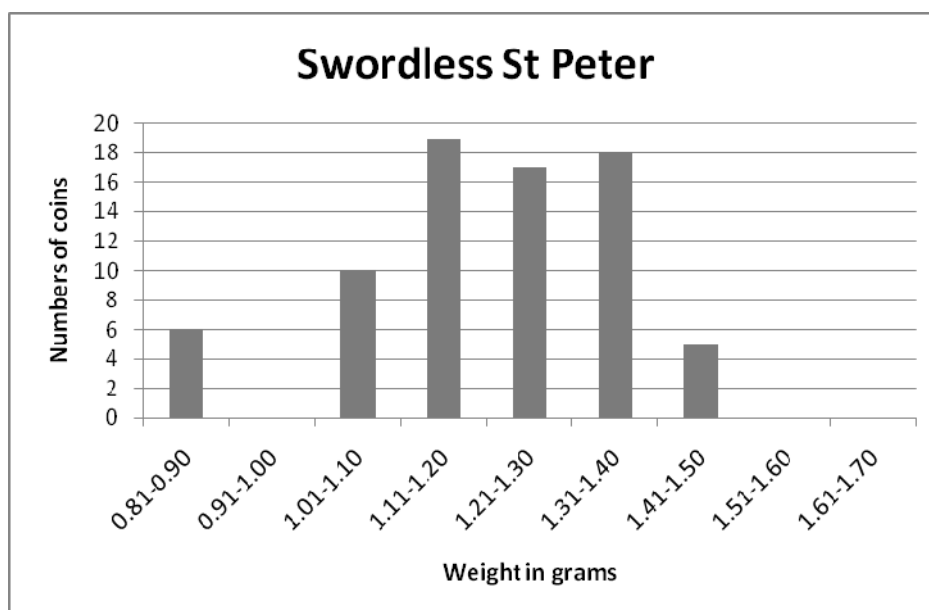


Figure 5.8 Chart showing the weight distribution of a sample of Viking Swordless St Peter coins (c.905-c.919).

The fineness of coins, although nominally set at the level which would equate to a pennyweight of pure silver in the coin, also varied between coins and over time. However, all coins were still worth the same – a penny – despite the large and small differences in weight and composition. It is the trust in the authority which issues the coin, rather than in the intrinsic value of the coin which determined the worth of a coin and this is the means by which coins circulate today, as they have very little intrinsic metal worth. Where there is no trusted central authority, or when coins find their way out of that authority's territory, these functions of coinage are not trusted implicitly. What becomes more important is the weight

and fineness of the coin; in short, the coin becomes mere bullion with a pretty design stamped upon it. In the Viking Age, the lack of trust in coins in the bullion phase in York led to the pecking of coins to test the fineness of the metal, but this testing ceased as coins issued in York were trusted.

To the modern eye coins are so much an improvement upon other systems of exchange that it is hard to understand why, if the Vikings in York had seen coins in use, they were not immediately adopted as the main means of exchange. Theories of money and monetisation are largely based upon the tenets of classical economics, from Aristotle's statement that money needed to be durable, transportable and inherently valuable, through the views of scholars such as Smith and Marx, to those of more recent theoreticians such as Simmel.⁶⁴ These theories see money as an unchanging concept throughout time and space, and it is argued implicitly that the role and meanings of money are universal and correspond with how money is viewed today. Anthropological work from the early twentieth century onwards has highlighted that concepts of money are based upon our modern understanding of money, and that these modern assumptions are not necessarily universal.⁶⁵

If the 920s was the period in which the use of money changed in the Viking Kingdom of York from a bullion economy to a coin-based system, what caused this change? The presence of coins in an economy is often seen as the catalyst for economic change, and its presence or

⁶⁴ Summarised in Maurer, 'The Anthropology of Money', 27; Aristotle, *Politics*, trans. by B. Jowett (<http://classics.mit.edu/Aristotle/politics.html> [accessed 27 June 2011]), Book I, Parts IX-X; Smith, *Wealth of Nations*, p. 27; G. Simmel, *The Philosophy of Money*, trans. by T. Bottomore and D. Frisby, revised edn (London: Routledge, 1978), p.249.

⁶⁵ Maurer, 'The Anthropology of Money', 19; Parry and Bloch, 'Money and the Morality of Exchange', p. 1.

absence is used as an index of that change.⁶⁶ The convenience of a durable object with inherent value in a standardised size, weight, purity of metal, or denomination, seems far more attractive than the inconvenience of a system involving non-standard units of hacksilver that needed to be tested or weighed at every transaction. Coins also provide the ability to trade at a distance, over time and with strangers, but only provided that the coins in question are widely trusted and accepted. Since the values of coins are standardised, strangers could deal with people they neither knew nor trusted, as long as they trusted the stamp upon the coin and will enter into an exchange relationship on the basis of it. Since the coins are made of precious and stable metals, usually silver or gold, they can also be spent days, weeks or years after they are acquired and, in large kingdoms or states, the inherent value means that they can be traded over vast geographical distances, such as the length and breadth of the Roman Empire. However, for the Vikings, trade using hacksilver had these advantages in that silver was valuable, did not rust easily, and could be carried long distances and retain its value. Hacksilver had the advantage that it could be collected easily and cut from any silver object and did not need to be exchanged or reminted when it entered a new kingdom, or could be turned into coin if it was needed, and it could be carried in very large or very small quantities.

The coin system, with the stamp of authority, is mainly of benefit to the issuing authority. Making coins creates an income from the seignorage charged per coin, and is also open to further abuse using the difference between the metal value and 'face' value of coins to its advantage. Henry VIII is infamous for his programme of coin debasement whereby he ordered the reduction of silver in his coins from 9oz 2dwt (out of 12oz) to 4oz 2dwt fine,

⁶⁶ Parry and Bloch, 'Money and the Morality of Exchange', p. 3.

whilst the coins were still worth at face value the same amount of money.⁶⁷ The debasement of coins benefits any monarch because, as the monopoly holder of mints, he can charge the same rate for production of coins whilst issuing coins that are worth less than this and profiting from the difference. It has also been argued that monarchs in late Anglo-Saxon England from the coinage reform of Edgar (c.973) onwards, used this difference between the face and intrinsic values of the coins to form a highly complex sexennial cycle of recoinages, which meant a steady income for the incumbent monarch.⁶⁸ However, debasement penalises people who exchange coins because they lose that difference in precious metal and should they want to use coins as bullion, it is worth substantially less in metal value than face value. The force of royal control and well-established custom of using coins meant for Henry VIII that despite the widespread unpopularity of this move, most of his coins were still accepted at their face value in exchanges, yet it caused major financial instability in late Tudor England.

Coins can be useful streams of income for monarchs, but a strong centralised government and mint administration are needed to enforce the acceptance of coins with varying metal quantity and quality. It is likely that Henry VIII's debasement tactics would not have been tolerated if his had been a weaker regime. Centralised government such as his did not exist in Viking-age Scandinavia and so the use of silver in any form as a means of exchange was actually a very good economic solution. Individuals trading would always know, and had responsibility for knowing, the value of the metal they exchanged, and that metal could always be exchanged again at the same value. Bullion transactions can be seen here as monetary in that they are formed by the exchange of something, in this case silver, at a fixed value.

⁶⁷ Spink, *Coins of England*, p. 219.

⁶⁸ Dolley and Metcalf, 'Reform of the English Coinage under Edgar', p. 146

If coins were not adopted because they were a better means of exchange, but usually as a result of some external force, what was that force? The Viking rulers had realized the potential for both the use of coins to promote their right to rule and to create revenue, but they did not ensure that their coins were the only ones in circulation, or indeed the only means of circulation in the kingdom. The obvious candidate for the external change which transformed the economy of the Viking Kingdom of York would be the invasion of Æthelstan in 927. The Anglo-Saxon kings were used to running their economy using coins and not bullion, and they had also managed to exclude the use of coins which were not minted under their aegis from their kingdoms. It would therefore seem likely that upon capturing the Kingdom of York they would attempt to enforce the same standards of coin-use.

There can be little doubt that, eventually, coins were used in all parts of the Viking world. In the northern Danelaw, coins were issued from the 890s, Ireland and the Isle of Man from the mid-tenth century, and in Denmark from the late tenth century, and in Scotland from the early eleventh century. So it could be argued that the evolutionary theory of monetisation really was behind this, but it is when and why these areas adopted coinage that is the important point. After all, for much of Iron Age Europe there is evidence of precious metal hoards, from the mid-third century BC.⁶⁹ Yet it was only much later, in the case of Scandinavia the tenth century, that coinage was adopted, even though people must have been aware of it before its adoption.

⁶⁹ Gaimster, 'Viking Economies', p. 124.

Conclusion

Although it is known that Viking economies all eventually became coin-based, it is the length of the bullion phase and the reasons why a kingdom became monetised that can be used to understand how economies functioned and were managed. The hoard evidence then shows that there was no clear evolutionary trend from a status economy to a bullion economy, but the use of coins grew in the late 920s. The use of coins, however, is never confined to domestic coins alone. The continuing presence of foreign coins in later hoards shows that the Viking administration either did not make enough coins, that it was not strong enough to exclude foreign coin from circulation, or that coins were still being used as convenient lumps of bullion. In later periods of history, foreign or non-standard coins were used when there was insufficient domestic coinage, such as the use trade tokens in the eighteenth century, used due to lack of small change being minted.⁷⁰ Yet in Chapter 4 it was shown that there would have been plenty of Viking coins in circulation as a great number seem to have been minted, on a par with the number minted in contemporary mints in the Anglo-Saxon kingdom, so the lack of available coins is not a reason for the continued use of foreign coins.

The question of the strength of government and ability to exclude foreign coins is a difficult one with the Viking Kingdom of York given that the bullion phase in York lasted for so many decades. It may have been less a lack of control which led to this continuation of the bullion economy, but more of a way of keeping money interchangeable between the kingdoms of Dublin and York, and with other kingdoms, which led to the continued use of foreign coins and hacksilver in the Northern Danelaw. It may have been more of a regional bias, in that

⁷⁰ G. Selgin, *Good Money: Birmingham Button Makers, the Royal Mint, and the Beginnings of Modern Coinage, 1775-1821* (Oakland, CA: University of Michigan Press, 2008), pp. 4-8.

coin-use was very difficult to enforce over the whole disparate kingdom away from the urban centre of York, especially on the West coast of England. Alternatively it could have been that, following the anthropological models discussed above, that foreign coins and hacksilver, and domestic coins served different monetary purposes, some special-purpose and some more commercial and general-purpose.

Chapter 6: Conclusion

Numismatics as an Historical Source

At the beginning of this thesis it was argued that the limitations of the documentary sources mean that many questions concerning the nature of political power in the Viking Kingdom of York remained unanswered. There is a lack of contemporary source material which was created within the Viking kingdom or by the Vikings themselves, and this leaves the historian to reconstruct the past from a variety of contemporary annals which were mostly written outside the kingdom under investigation, and histories written at a later date. The administrative sources that are such useful tools of historical investigation to reveal how power was exercised, documents such as charters, writs and laws, are largely non-existent for York. There is, however, one prolific, strictly contemporary source of evidence in the coins of the Viking Kingdom of York which began production in c.895 and were issued until the last Viking king Eric was expelled from York in 954.¹

The coins of the Viking kingdom are not one source, but many, comprising the various different coin types which were issued under the different Viking kings of York. The coins are unique amongst the sources for Viking York as they were made at the behest of the Viking kings for people in their kingdom. These coins have previously been used extensively by historians to understand the chronology of the succession of these kings, but the numismatic evidence can be used to answer questions beyond dating events or finding Latin texts upon

¹ For discussion on the dates of Eric's expulsion and the end of the Viking Kingdom of York, see Chapter 2, pp. 105-7.

coins.² In this thesis different numismatic methodologies have been used to investigate different aspects of the power of the Viking Kings of York. First, iconographical and epigraphical analysis was used to understand how the Viking kings sought to legitimise their rule. Secondly, statistical analysis was used to estimate the volume of Viking currency, to see whether the iconographic messages on coins could have been widely disseminated, and also to understand whether the Vikings were capable of producing enough coins to supply their economy. Finally the distribution of coins in both hoards and as single-finds was examined to understand where and how Viking coins were used. This information was then used to identify the Viking rulers' power over the economy, and how far this power reached across their kingdom.

In this work, coins have been used as the main source of primary and contemporary evidence. Their design and method of production, use, deposition in the ground and recovery today have all been used to question this evidence. Some methodologies worked better than others; the statistical use of coins was limited by the very small samples of some coin types such as the coins of Rægnald in calculating the volume of the coinage. With limited information it is possible to draw some conclusions, but the use of this information must always be informed by the statistical likelihood of error in the sample. By contrast, other coin types, such as those of Cnut and Siefred contain large numbers of extant coins and have produced very interesting and fairly accurate data. Small sample sizes were also a problem with some of the analysis of the distribution of coins in the Kingdom of York. It was very hard to draw conclusions about distribution trends with only a handful of coins, but luckily not all of the samples were small.

² Smyth, *Scandinavian York and Dublin, II*, p.143; Rollason, *Sources for York History*, pp. 177-8.

With the iconographical investigation, the lack of a large sample for some coin types was less of a problem, as it was the images, rather than statistical data which was being investigated.

Money and Power in the Viking Kingdom of York

Through the use of these numismatic methodologies, how the Vikings gained, used and maintained their power has been investigated. In Chapter 2, the ways in which the Viking kings projected their power and authority were seen through the designs and iconography of the coins. The coins were examined to test whether they could reveal the mechanisms through which the Viking kings expressed their legitimacy to rule York. This work revealed that the iconography on Viking coins was carefully chosen, most likely with the assistance of the Church at York, to proclaim both the kings' Christian faith (even if they were not in fact Christians) and the support of the Church for their rule. Religion, specifically Christianity, was a tool through which the Vikings claimed that they had the credentials and the necessary support to rule. The coins were also used to advertise the proficiency of the Vikings in armed combat through the use of weapon imagery. Placing swords and a bow and arrow upon coins was a unique way of using martial imagery, and an innovation of the Vikings not seen on coins from any other kingdom. Finally the Vikings used imitations of Anglo-Saxon types and Roman themes such as portraiture to give their coins, as well as their rule, an air of authority and legitimacy. The Vikings had arrived in York familiar with coins, but unfamiliar with issuing them as part of a royal administration. The numismatic evidence shows that from the 890s the Viking rulers were issuing coins with unique designs which combined messages of religion, warfare and lineage to provide justification for their power in the Kingdom of York.

The subject of the volume of the early medieval currency in England has been one of much debate over the last fifty years, and the aim of Chapter 3 was to ask firstly, how is the volume of currency calculated, and then how large was the Viking currency? Various methods were discussed concerning how to estimate the volume of a currency, and a methodology based upon three different calculations for estimating the number of dies which were used to create a coinage was used. This methodology was then applied, not only to data from the Viking Kingdom of York, but also to later Anglo-Saxon and later English coin types. The results from the latter were used for comparison with the data from Viking York and revealed some striking results. It seems that Viking coins were not just produced in large enough quantities to transmit the messages upon them widely, but in quantities which were similar to much later output from major Anglo-Saxon mints. The evidence for this was weaker for some coin types than others, but overall there was enough to form a sound conclusion. These results were remarkable because from the evidence of Viking coins in hoards and single finds alone, it did not seem as if the Vikings made a comparable number of coins to major Anglo-Saxon mints. The results therefore not only demonstrated that the Viking mint at York was a major force in the Viking economy of the tenth century, but also confirmed that statistical methods for the calculations of dies could add valuable historical data and interpretations.

The search for the Kingdom of York has long been led by research into the documentary sources, but the distribution of coin finds proved a fruitful new avenue as detailed in Chapter 4. Whilst they did not give a clear picture of the boundaries of the Vikings' lands, the distribution of coins, especially of single finds, gave some indication of the influence of the Viking kings on the economy of areas outside the city of York. Despite the documentary

evidence for various parts of Kingdom of York and the Five Boroughs changing hands several times between Viking kings and their Anglo-Saxon neighbours, the coins show that the Viking sphere of economic influence was relatively stable throughout the Viking age. The core of Viking power was in York and lands north of the Humber, south of the Tees and east of the Pennines. There was also a weaker concentration of Viking power in Lincolnshire and the Five Boroughs. However, a look at some of the sculptural evidence showed that Viking cultural influence was particularly strong in the Eden Valley, Cumbria and the Tees valley which contrasted with the lack of coin evidence for these areas. This was not because the coins were not being produced in sufficient quantities, which were shown, in Chapter 3, to be adequate, and also the evidence of Northumbrian stycas made in York showed a much wider distribution than the Viking coins. It was concluded that, although Vikings may have settled throughout the north of England, the political power of the Viking kings did not spread far beyond the city in which they were based. A question which arose from this chapter was whether the Vikings, unlike their Anglo-Saxon neighbours, did not or could not enforce a policy of the exclusion of foreign coins from their own kingdom as coins made in the Anglo-Saxon, Carolingian and Islamic kingdoms were found widely across Viking contexts.

It was this question which was addressed in Chapter 5, where it was asked whether the finds of foreign coins represented a political inability to exclude foreign currency, or that the economy in York functioned in a different manner which did not require such exclusion of foreign coins. The models proposed for Viking-age economies were discussed, and the evidence from Viking York showed that there was no clear evolutionary trend from using ornaments as gifts to using coins for commercial transactions. The Kingdom of York was

unique in that it embraced people who were familiar with using coins, but was ruled by men who had come from places where the money used for exchange was hacksilver. This combination led to a prolonged phase in York's history in which both coins and bullion were used as currency simultaneously. It was discussed whether different forms of money such as hacksilver or coins were used in different economic spheres and paid for different kinds of goods and services, but there was no conclusive evidence to be able to confirm this either way, although there were suggestive modern anthropological analogies. The combined bullion and coin phase in York appeared to suit both the Northumbrians and the Vikings in that people could trade within the Kingdom of York, in areas which both used coins and those which used bullion. The continuing bullion economy also enabled trade with other Viking settlements such as Dublin, and as well as Scandinavia and the Scottish Islands. There was a change in the economy in the 920s, and given that both coins and hacksilver had circulated together for at least a quarter of a decade, it was asked what prompted this change. Since there was little evidence for the evolutionary change of the Viking economy in York, it appeared that the external catalyst of Æthelstan's annexation of the Viking kingdom was what prompted the move towards a fully monetised economy. The areas in which hacksilver and ornaments were found in hoards after this date were either on the fringes of the Viking kingdom as defined by the single-find evidence, or else they were well beyond areas subject to direct control by the Viking kings, such as in Ireland or Scotland.

The Viking rulers of York reigned over a very large kingdom for nearly a century, but the vital questions of how they exercised their power, and how far this power extended has not yet been answered satisfactorily. There had been a focus on questions of chronology and the

origins of the Vikings, but little understanding of the political and economic aims of Viking kings. This work has shown that they had a sophisticated understanding of how to use their coins to help achieve these aims. The Viking rulers used coins as one means, and there were undoubtedly others which have not been covered here, to express their power. They worked with and were supported by the Church at York, and they drew upon knowledge of what was expected of an early medieval king and made sure that their coins represented this. But coins were not just bearers of designs, they were also a major part of the Viking economy and were produced in large quantities which could easily have supplied the whole kingdom with coins. However, the use of these coins was not widespread but centred upon the heart of the Viking kingdom in York and its hinterland with some control of the Five Boroughs. Although the Vikings appreciated the benefits of producing coins, they did not insist that their coins were the exclusive means of exchange in their kingdom, especially where their power was weakest to the west of the Pennines. A bullion economy ran concurrently with the coin economy until the invasion of the Anglo-Saxon kings and their reform of the coins in York. The numismatic evidence has shown that there is much more to be understood about the Vikings of York than is apparent from the documentary sources, and that these used in combination with numismatic research can start to illuminate the inner workings of this kingdom.

Further Questions and Research

There is, however, still scope for both further work using these numismatic methods on the Viking Kingdom of York and also on other kingdoms. Research need not be led by the needs of refining the chronology of the historical events through the coinage. The work on iconography has been pioneered with the sceatta series by Gannon which has inspired a closer

look at many coin types including the Viking coins here.³ This approach seems particularly rewarding where there is little other contemporary documentary evidence such as in the Viking Kingdom of York. Although much study has been done on the Anglo-Scandinavian coinages in Sweden and Denmark, this work has focused on estimating the volume of the currencies rather than analysis of the meaning and messages of the designs.⁴ To undertake a study of this kind would be a vast amount of work, but one that could potentially reveal a great deal about the rulers of tenth- and eleventh-century Scandinavia.

The period of Anglo-Saxon rule in York has not as yet been the subject of a full and published die study. An investigation into these coins could yield important data for studies of Anglo-Saxon mint output, especially since the numbers of York coins from York are likely to be much higher than the very small samples of coins for the Viking coins of York after 939.⁵ Data for the Anglo-Saxon coin types at York would enable comparisons over time and give some indication of how mint output was affected by the repeated changes in rule in York. It would also provide a contemporary comparison for the Viking data, rather than the later tenth-century coin types which have been studied already and were available for discussion and comparison here.

There is also much work to do on the recent hoard discoveries such as the Vale of York hoard, which has greatly increased the numbers of extant Sword type coins for the 920s, as well containing hundreds of new specimens of coins of Edward the Elder and Æthelstan. It would

³ Gannon, *Iconography of Early Anglo-Saxon Coinage*.

⁴ Malmer, *Anglo-Scandinavian Coinage*.

⁵ The rest of tenth-century Anglo-Saxon coin types have been studied in Blunt, Stewart and Lyon, *Coinage in Tenth Century England*.

be interesting to compare the data from York and the Anglo-Saxon and English kingdoms with coins from other mints. Work is currently being undertaken on the Hiberno-Manx and Hiberno-Norse coinages with die studies already in preparation.⁶ Will these studies reveal that a surprisingly-large number of coins were made in Ireland and the Isle of Man compared to Anglo-Saxon outputs, and will the numbers look similar to the output from Viking York, or were the Kings of York different?

The use of coin distributions has been popularized by the availability of the Portable Antiquities Scheme data, and several studies with vast sets of data on English medieval and Roman coins have been undertaken.⁷ These works have expanded upon what is known about how coins were deposited and what this represents about the society in which they were deposited. There is therefore scope to use this data, especially where it is from periods where there is data about mint practices and outputs, to understand the relationship between coin production and deposition and what this can say about the powers that issued those coins.

The use of numismatics for historical research may thus begin to reveal answers to questions about which the documentary sources have often been stubbornly silent. The Viking Kingdom of York, through numismatic study, has been revealed to be a major independent kingdom, run by men who knew how to manipulate the new coins they encountered to their best advantage. They combined money from England and Scandinavia with imagery both Christian and pagan to achieve their own ends. The Viking kings may not always have been

⁶ K. Bornholdt-Collins (SCBI volume) and A. Woods (PhD, University of Cambridge).

⁷ R. Kelleher (PhD, University of Cambridge) and P. Walton (PhD, University of London).

successful in ruling York, and eventually failed to keep hold of their kingdom, but this was not because they lacked economic power or sophisticated political knowledge.

Appendix I: Swordless St Peter Classification and Dies

Figure I.1 Table showing the classificatory scheme of tenth-century Two Line coins. The scheme is based on that given by Blunt, Stewart and Lyon in *Coinage in Tenth-Century England*, p. 13, with additional classifications for the Swordless St Peter type coin. All combinations highlighted in grey are found in the Swordless St Peter type.

H	1	2	3	4	5	6	7	8	9	10	11	12	13
T Trefoil	+ + +	°+°	⋈⋈⋈⋈	?+?	EBBA	...	⋈⋈⋈	+ - +	???	>°<	·	+	· + ·
P Pellet	+ + +	°+°	⋈⋈⋈⋈	?+?	EBBA	...	⋈⋈⋈	+ - +	???	>°<	·	+	· + ·
R Rosette	+ + +	°+°	⋈⋈⋈⋈	?+?	EBBA	...	⋈⋈⋈	+ - +	???	>°<	·	+	· + ·
B Blank	+ + +	°+°	⋈⋈⋈⋈	?+?	EBBA	...	⋈⋈⋈	+ - +	???	>°<	·	+	· + ·
C Cross	+ + +	°+°	⋈⋈⋈⋈	?+?	EBBA	...	⋈⋈⋈	+ - +	???	>°<	·	+	· + ·
D Double Pellet	+ + +	°+°	⋈⋈⋈⋈	?+?	EBBA	...	⋈⋈⋈	+ - +	???	>°<	·	+	· + ·
Q Quatrefoil	+ + +	°+°	⋈⋈⋈⋈	?+?	EBBA	...	⋈⋈⋈	+ - +	???	>°<	·	+	· + ·
M Misc	+ + +	°+°	⋈⋈⋈⋈	?+?	EBBA	...	⋈⋈⋈	+ - +	???	>°<	·	+	· + ·
Br Branch	+ + +	°+°	⋈⋈⋈⋈	?+?	EBBA	...	⋈⋈⋈	+ - +	???	>°<	·	+	· + ·
HQC6	⋈	HP6varS	·	HB6varΛ	·	HP11varS	·	HP6var Inf	·	HA6	·		
HCh6	+		...		Λ		s		oo		...		
	>	HP11var	·	HP6varC	·	HB6varw	·	HMQ6	...	HP6varD	·		
	...)·(...	C	ω		
	>		·						⋈		D		

To read the table:

- All these coin types begin H for Horizontal Two Line type
- The symbols above and below the text define the next letter
- The symbols either side of the central symbol define the number
- Additional symbols are variants at the bottom

Key

- + Small cross pattée
- ⋈ Trefoil of pellets
- Single pellet
- ⋈⋈ Rosette of pellets
- ⋈⋈ Double pellets
- ? Any symbol
- ψ Double-branch symbol
- ω Single-branch symbol
- EBBA Moneys's name
- ° Annulet
- ⋈⋈ Quatrefoil of pellets
- > Chevron
- s S-shaped symbol
- oo Infinity symbol
- D D-shaped symbol
- C C-shaped symbol
- Λ Unbarred-A
-) Curved symbol

Figure I.2 Table showing the symbols found on the Swordless St Peter coins, with the total numbers of obverse and reverse dies for comparison, and the total sample of coins.

Variation	Number of dies
One Line/retrograde	8
Branch symbol	16
Star	1
Key	19
Halfpennies	3
Contraction mark	44
Karolus monogram	3
Total obverse dies	121
Total reverse dies	138
Total coins	172

Appendix II: Die link diagrams and die estimate data

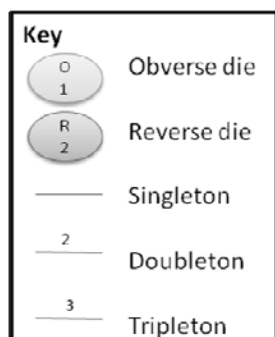
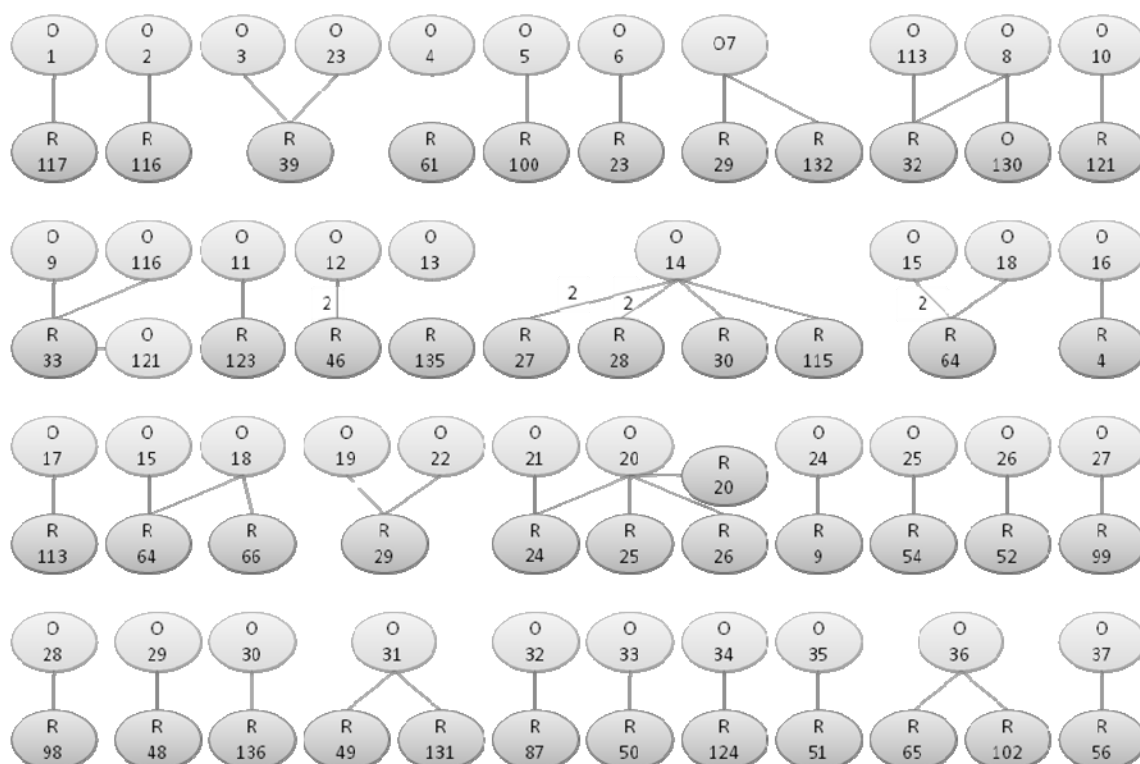
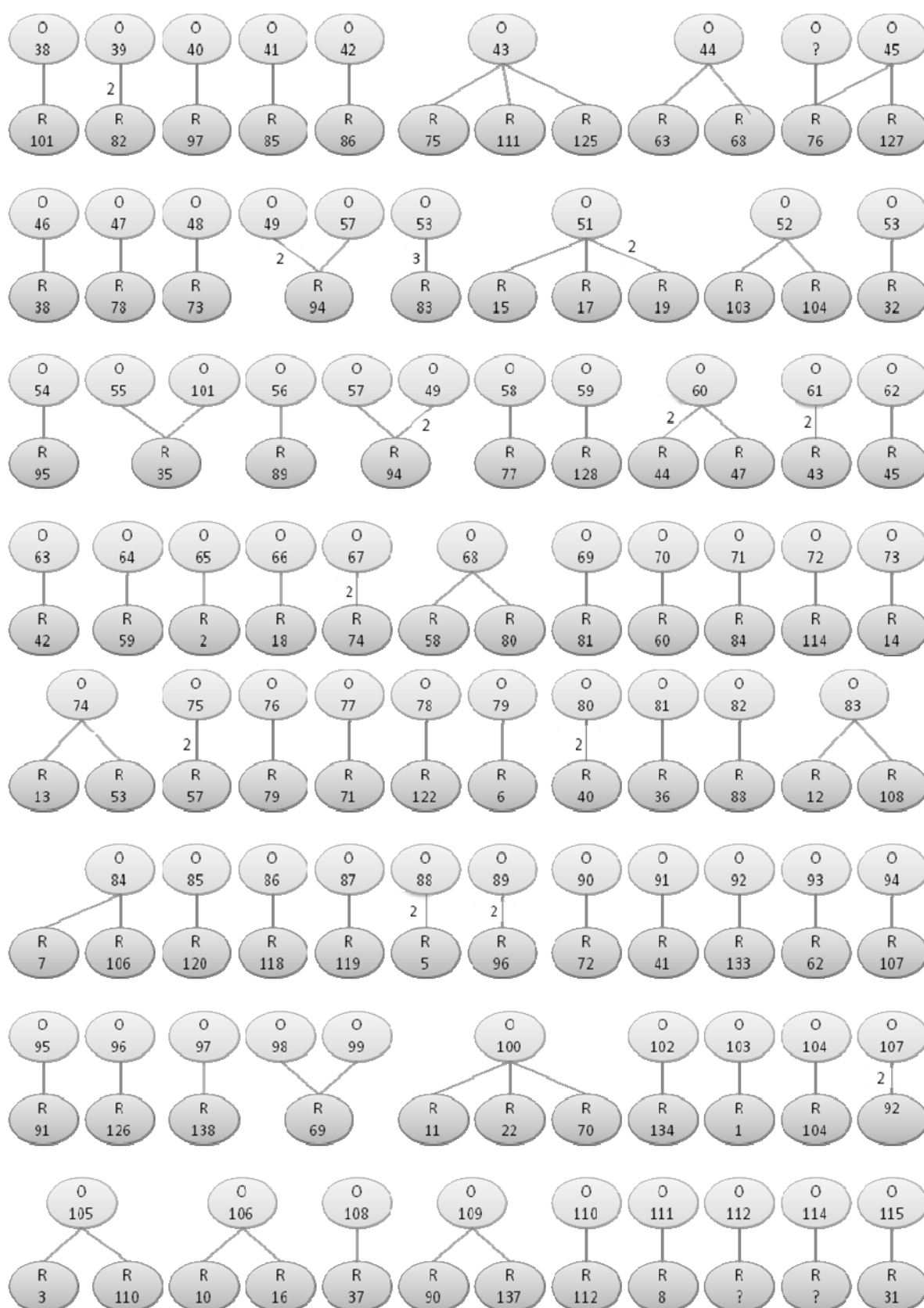


Figure II.1. Die link diagram of the Swordless St Peter coinage.

Swordless St Peter die links





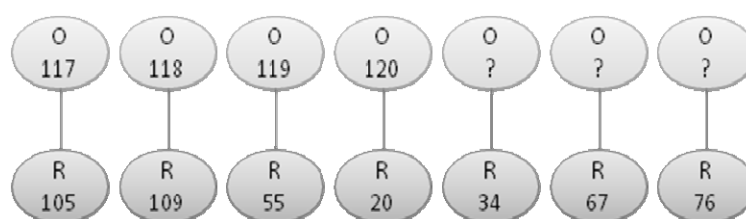
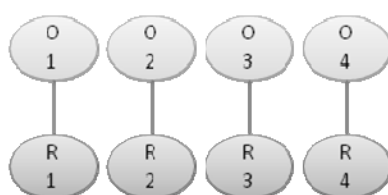
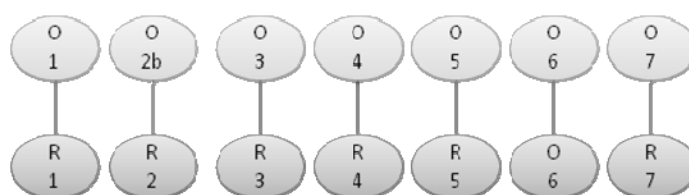


Figure II.2. Die link diagrams of the coins of the Viking Kingdom of York, 939-954.¹

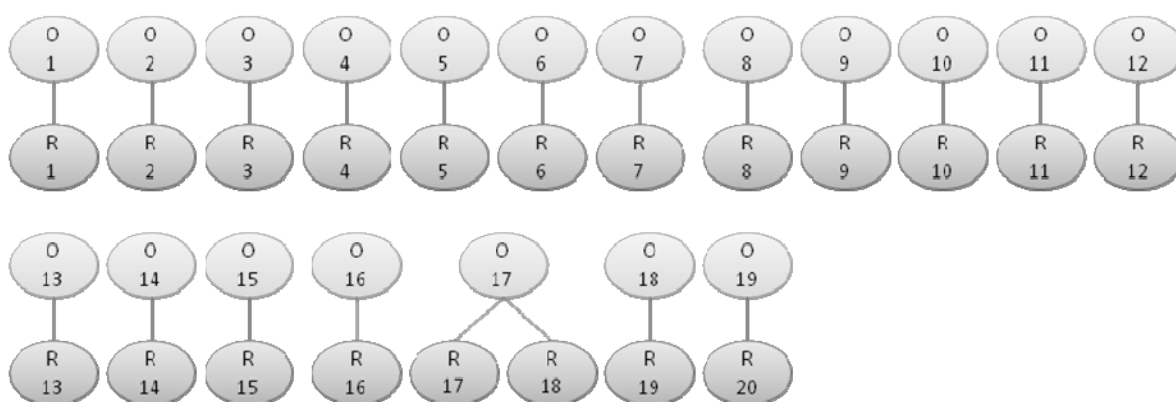
Group I: Ola^f, CC, Derby



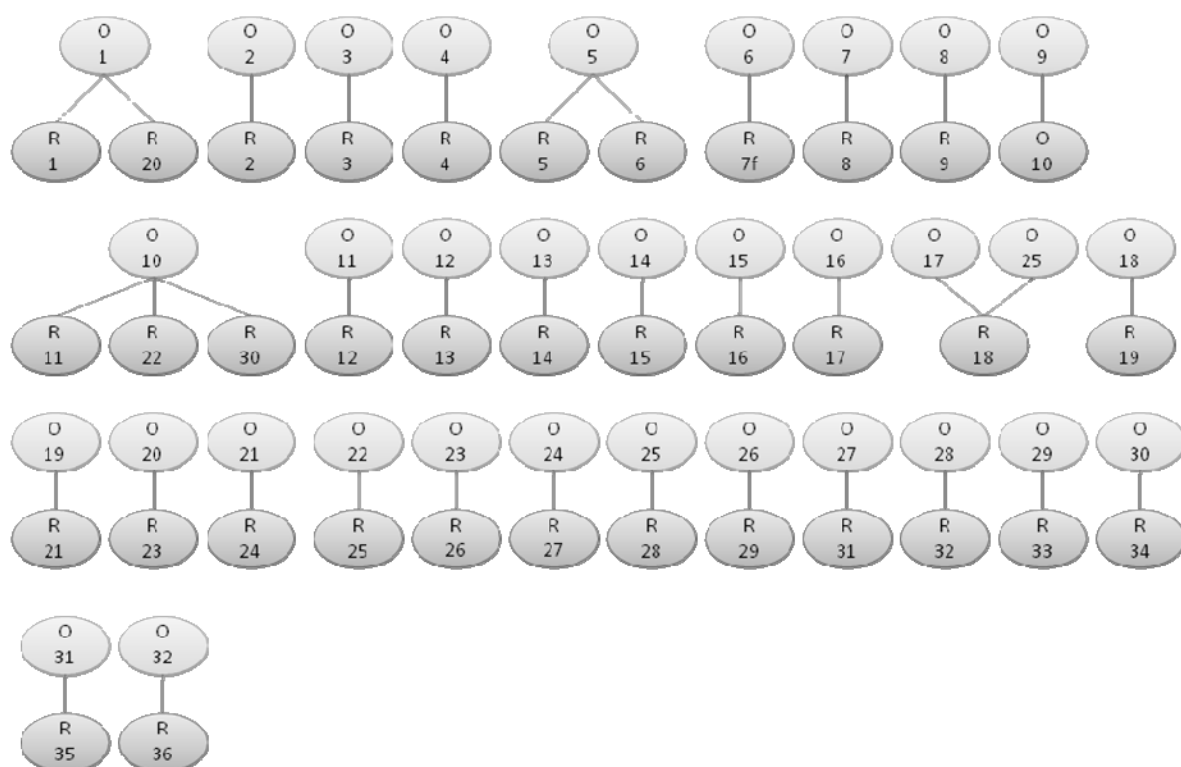
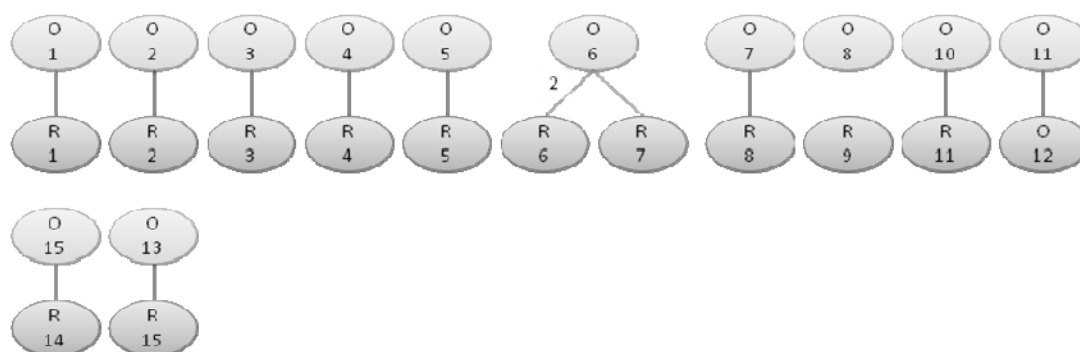
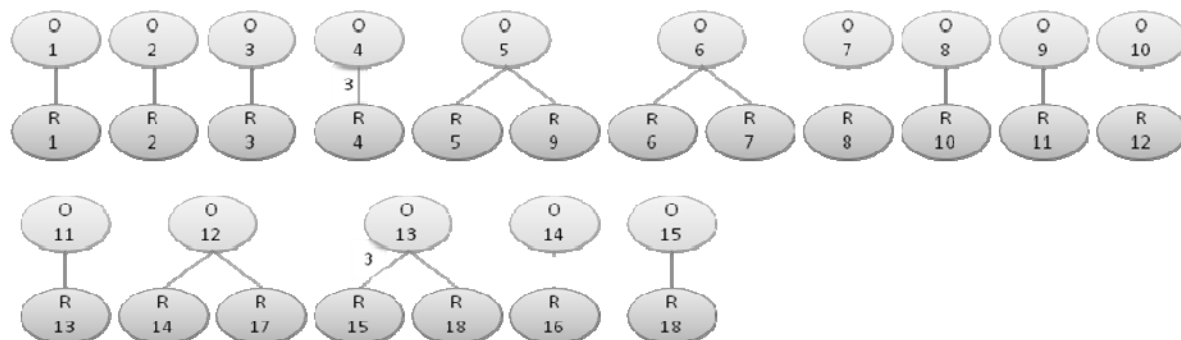
Group II-III: Olaf, HT 1 Southumbrian



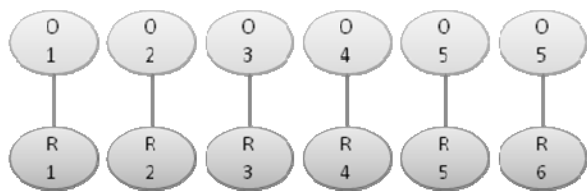
Group V: Triquetra/Standard type of Olaf, Sihtric and Rægnald



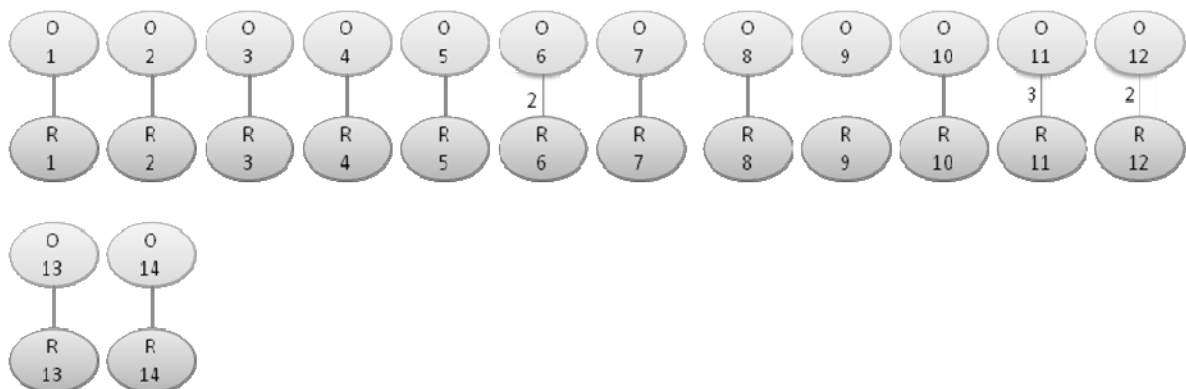
¹ Data based on Blunt, Stewart and Lyon, *Coinage in Tenth-Century England*, pp. 229-34.

Group IV: Anlaf, Raven**Group VI: CC and CM types of Anlaf, Sihtric and Regnald****Group VII: HT 1 type of Eric**

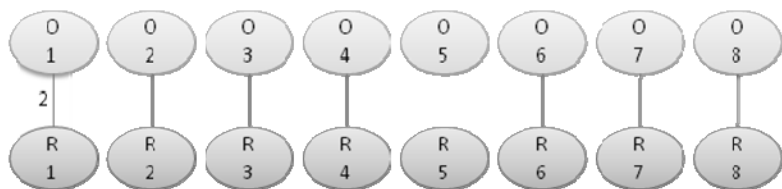
Group VIII: HT 1 ELTANGERHT



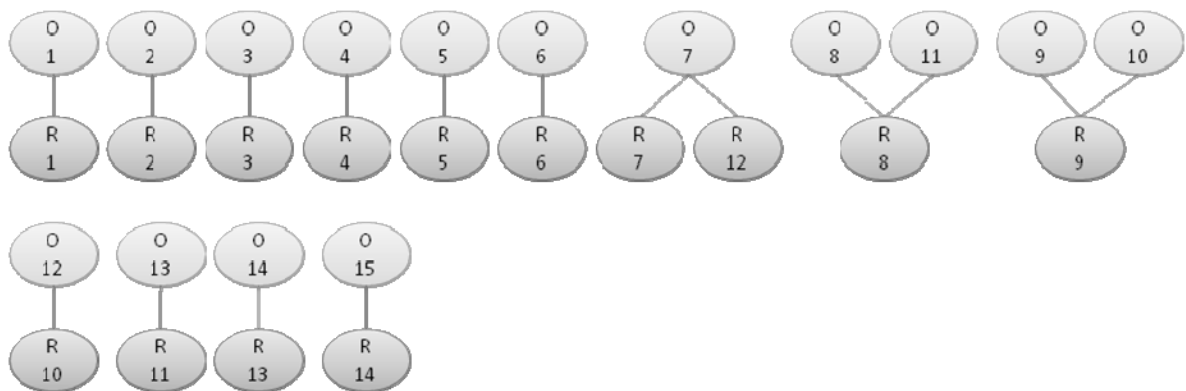
Group IX: Olaf's late CC type



Group X: Olaf Flower type



Group XI: Eric's Sword type



Appendix III: Die Data and Calculations for Viking, Anglo-Saxon and English Coin Types

Dates*	Data source	Type								Esty			Carter						Do/t				Range Do	Notes
			n	do	dr	F1o	F1r	n/do	n/dr	Esty Do	Esty Dr	Do:Dr	Carter Do	Carter Dr	Do:Dr	Good Do	Good Dr	Good Do:Dr	t low	t high	lowest	highest		
c.880-90	Blackburn, 2005, p.32	Guth Horizontal	39	33	34	28	29	1.2	1.1	214.5	265.2	1.2	164.1	199.5	1.2	117.0	132.6	1.1	10	10	12	21	117-215	
c.895-c.905	Lyon & Stewart, p.106	Regal All	598	250	unp	unp	unp	2.4	-	429.6	-	-	357.5	-	-	-	-	-	10	10	36	43	358-429	
c.905-c.919	Gooch	Slp	163	121	138	84	109	1.3	1.2	469.6	899.8	1.9	371.8	688.0	1.9	249.7	416.6	1.7	14	14	18	34	250-470	
c.919-c.921	Blunt & Stewart, p.147	Rag Portrait	3	3	2	3	1	1.0	1.5	-	6.0	-	176.5	4.8	0.0	-	3.0	-	2	3	59	88	177	
c.919-c.921	Blunt & Stewart, pp.147-9	Rag Hand	16	15	14	14	12	1.1	1.1	240.0	112.0	0.5	163.4	84.0	0.5	120.0	56.0	0.5	2	3	40	120	120-240	
c.919-c.921	Blunt & Stewart, p.149	Rag Bow & Arrow	4	3	3	2	2	1.3	1.3	12.0	12.0	1.0	9.5	9.5	1.0	6.0	6.0	1.0	2	3	2	6	6-12	
c.919-c.921	Blunt & Stewart, pp.147-9	Rag All	23	21	19	19	15	1.1	1.2	241.5	109.3	0.5	173.4	84.4	0.5	120.8	54.6	0.5	2	3	40	121	121-242	
c.920-930	Blackburn, 2006, p.216	Swords All	112	63	83	unp	unp	1.8	1.3	144.0	320.6	2.2	116.5	253.9	2.2	-	-	-	6	6	19	24	117-144	
c.921-c.927	Blackburn, 2006, p.216	Sword St Peter	83	38	56	unp	unp	2.2	1.5	70.1	172.1	2.5	57.7	57.1	1.0	-	-	-	6	6	10	12	58-70	
c.920s	Blackburn, 2006, p.216	Anon. Sword	5	5	5	5	5	1.0	1.0	-	-	-	294.1	294.1	1.0	-	-	-	1	2	147	294	294	
c.920s	Blackburn, 2006, p.216	Sword St Martin	7	4	6	2	5	1.8	1.2	9.3	42.0	4.5	7.5	31.9	4.2	5.6	21.0	3.8	1	2	3	9	6-9	
c.920s	Blackburn, 2006, p.216	Sihtric Caoch	17	16	16	15	15	1.1	1.1	272.0	272.0	1.0	183.0	183.0	1.0	136.0	136.0	1.0	4	5	27	68	136-272	
c.920s	Blackburn, 2006, p.216	Southern sword types All	29	25	27	22	25	1.2	1.1	181.3	391.5	2.2	137.3	271.2	2.0	103.6	195.8	1.9	6	6	17	30	104-181	
924-939	Lyon, 2011	Aths CC (Win)	16	11	11	6	7	1.5	1.5	35.2	35.2	1.0	28.1	28.1	1.0	17.6	19.6	1.1	15	15	1	2	18-35	
924-939	Lyon, 2011	Aths BC (Win)	23	13	13	6	3	1.8	1.8	29.9	29.9	1.0	24.2	24.2	1.0	17.6	15.0	0.9	15	15	1	2	18-30	
939-941	CTCE, p.229-30	Anlaf Raven	36	31	35	30	35	1.2	1.0	223.2	1260.0	5.6	169.2	696.5	4.1	186.0	1260.0	6.8	2	2	85	112	186-223	
c.942-3	CTCE, p.231	Triquetra	20	19	20	18	20	1.1	1.0	380.0	-	-	247.2	1176.5	4.8	190.0	-	-	2	2	95	190	190-380	
c.942-3	CTCE, p.231-2	CC/CM	16	13	15	12	14	1.2	1.1	69.3	-	-	53.8	163.4	3.0	52.0	120.0	2.3	2	2	26	35	52-69	
c.940s	CTCE, p.229-30	Anlaf Southumbrian	12	12	12	12	12	1.0	1.0	-	-	-	705.9	705.9	1.0	-	-	-	2	2			706	
947-8	CTCE, p.232-3	Eric Horizontal	23	15	19	11	17	1.5	1.2	43.1	109.3	2.5	34.6	84.4	2.4	28.8	72.8	2.5	2	2	14	22	29-43	
c.940s	CTCE, p.233-4	Anlaf (restored)	26	21	21	12	12	1.2	1.2	109.2	109.2	1.0	85.0	85.0	1.0	39.0	39.0	1.0	2	2	20	55	39-109	
952-4	CTCE, p.234	Eric Sword	16	15	14	14	10	1.1	1.1	240.0	112.0	0.5	163.4	84.0	0.5	120.0	37.3	0.3	2	2	60	120	120-240	
939-973	CTCE, pp.181-90	Saxon CC/CM (excl. Yor)*	222	unp	144	unp	91	-	1.5	-	409.8	-	-	329.1	-	-	244.0	-	34	34	7	12	244-410	nb. This is Dr/t
955-59	Lyon	Eadw HT3 (Win)	3	2	2	1	1	1.5	1.5	6.0	6.0	1.0	4.8	4.8	1.0	3.0	3.0	1.0	5	5	1	1	3-6	
959-c.973	Lyon	Edg CC (Win)	34	31	31	28	28	1.1	1.1	351.3	351.3	1.0	252.8	252.8	1.0	175.7	175.7	1.0	14	14	13	25	176-351	
c.973-5	Mossop, Table 4	Edg Reform To First Small Cross (Lin)	68	32	46	14	30	2.1	1.5	60.4	142.2	2.4	49.5	49.2	1.0	40.3	82.3	2.0	2	3	13	30	40-60	
c.973-9	Lyon	Edg Reform to Æthr First Small Cross (Win)	50	34	35	24	25	1.5	1.4	106.3	116.7	1.1	78.5	93.1	1.2	65.4	70.0	1.1	6	6	11	18	65-106	

Dates*	Data source	Type	n	do	dr	F1o	F1r	n/do	n/dr	Esty Do	Esty Dr	Esty Do:Dr	Carter Do	Carter Dr	Carter Do:Dr	Good Do	Good Dr	Good Do:Dr	t low	t high	Do/t lowest	Do/t highest	Range Do	Notes
c.973-9	Lyon	Edg Reform to Æthr First Small Cross (Yor)	108	64	79	40	61	1.7	1.4	157.1	294.2	1.9	122.6	233.4	1.9	101.6	181.5	1.8	6	6	17	26	102-157	
c.979-85	Mossop, Table 4	Æthr First Hand (Lin)	46	29	33	19	26	1.6	1.4	78.5	116.8	1.5	63.1	63.1	1.0	49.4	75.9	1.5	6	6	8	13	49-79	
c.979-85	Lyon	Æthr First Hand (Win)	144	74	94	41	62	1.9	1.5	152.2	270.7	1.8	123.6	217.3	1.8	103.5	165.1	1.6	6	6	17	25	104-152	
c.979-85	Lyon	Æthr First Hand (Yor)	133	70	90	45	63	1.9	1.5	147.8	278.4	1.9	119.9	222.8	1.9	105.8	171.0	1.6	6	6	18	25	106-148	
c.985-991	Lyon	Æthr Second Hand (Win)	61	37	43	23	33	1.6	1.4	94.0	145.7	1.5	75.8	116.1	1.5	59.4	93.7	1.6	6	6	10	16	59-94	
c.985-991	Lyon	Æthr Second Hand (Yor)	1	1	1	1	1	1.0	1.0	-	-	-	58.8	58.8	-	-	-	-	6	6	10	10	59	
c.985-991	Lyon	Æthr Benediction Hand (Win)	18	12	10	7	3	1.5	1.8	36.0	22.5	0.6	28.8	18.2	0.6	19.6	12.0	0.6	6	6			20-36	
c.991-997	Mossop, Table 4	Æthr Crux (Lin)	224	103	127	60	80	2.2	1.8	190.7	293.3	1.5	156.8	155.2	1.0	140.7	197.6	1.4	6	6	23	32	141-191	
c.991-997	Lyon	Æthr Crux (Win)	666	151	219	38	69	4.4	3.0	195.3	326.3	1.7	185.5	276.6	1.5	160.1	244.3	1.5	6	6	27	33	160-195	
c.991-997	Lyon	Æthr Crux (Yor)	330	114	203	58	126	2.9	1.6	174.2	527.5	3.0	172.5	142.4	0.8	138.3	328.4	2.4	6	6	23	29	138-174	
995-1005	Malmer	Anglo-Scandinavian	3704	752	1218	unp	unp	4.9	3.0	943.6	1814.8	1.9	896.4	837.6	0.9	-	-	-	25	25	36	38	896-943	
c.997-1003	Mossop, Table 4	Æthr Long Cross (Lin)	642	155	183	58	76	4.1	3.5	204.3	256.0	1.3	194.1	220.8	1.1	170.4	207.6	1.2	6	6	28	34	170-204	
c.997-1003	Lyon	Æthr Long Cross (Win)	344	23	34	7	2	15.0	10.1	24.6	37.7	1.5	23.4	35.8	1.5	23.5	34.2	1.5	6	6	4	4	24-25	
c.997-1003	Lyon	Æthr Long Cross (Yor)	497	64	139	16	53	7.8	3.6	73.5	193.0	2.6	69.8	166.8	2.4	66.1	155.6	2.4	6	6	11	12	66-74	
c.1003-9	Mossop, Table 4	Æthr Helmet (Lin)	169	79	80	44	41	2.1	2.1	148.3	151.9	1.0	121.7	124.4	1.0	106.8	105.6	1.0	6	6	18	25	107-148	
c.1003-9	Lyon	Æthr Helmet (Win)	152	32	42	4	7	4.8	3.6	40.5	58.0	1.4	38.5	50.2	1.3	32.9	44.0	1.3	6	6	5	7	33-41	
c.1003-9	Lyon	Æthr Helmet (Yor)	284	55	107	15	47	5.2	2.7	68.2	171.7	2.5	64.8	144.4	2.2	58.1	128.2	2.2	6	6	10	11	58-68	
c.1009-17	Mossop, Table 4	Æthr Last Small Cross (Lin)	595	247	277	120	149	2.4	2.1	422.3	518.3	1.2	351.7	425.5	1.2	309.4	369.5	1.2	8	8	39	53	309-422	
c.1009-17	Lyon	Æthr Last Small Cross (Win)	592	144	178	41	63	4.1	3.3	190.3	254.5	1.3	180.8	218.3	1.2	154.7	199.2	1.3	8	8	19	24	155-190	
978-1016	Lyon	Aethelred All (Lincoln)	8010	1998	2900	556	838	4.0	2.8	2662.0	4545.8	1.7	2528.9	3835.2	1.5	2147.0	3238.8	1.5	123	35	61	22	747-967	
c.1009-17	Lyon	Æthr Last Small Cross (Yor)	463	93	164	23	52	5.0	2.8	116.4	254.0	2.2	110.6	214.6	1.9	97.9	184.7	1.9	8	8	12	15	98-116	
c.1017-23	Mossop, Table 4	Cnut Quatrefoil (Lin)	523	245	276	116	143	2.1	1.9	460.9	584.4	1.3	378.1	474.0	1.3	314.8	379.9	1.2	6	6	52	77	314-461	
c.1017-23	Lyon	Cnut Quatrefoil (Win)	391	168	203	76	104	2.3	1.9	294.6	422.2	1.4	244.4	342.6	1.4	208.5	276.6	1.3	6	6	35	49	209-295	
c.1017-23	Lyon	Cnut Quatrefoil (Yor)	595	154	276	54	139	3.9	2.2	207.8	514.8	2.5	178.9	422.9	2.4	169.4	360.1	2.1	6	6	28	35	169-208	
1024-30	Mossop, Table 4	Cnut Pointed Helmet (Lin)	508	174	186	74	77	2.9	2.7	264.6	293.4	1.1	224.2	247.3	1.1	203.7	219.2	1.1	6	6	34	44	204-265	
1024-30	Lyon	Cnut Pointed Helmet (Win)	283	63	83	18	28	4.5	3.4	81.0	117.4	1.4	77.0	101.0	1.3	67.3	92.1	1.4	6	6	11	14	67-81	
1024-30	Lyon	Cnut Pointed Helmet (Yor)	964	146	234	22	52	6.6	4.1	172.1	309.0	1.8	163.5	293.6	1.8	149.4	247.3	1.7	6	6	25	29	149-172	
c.1029-35/6	Mossop, Table 4	Cnut Short Cross (Lin)	496	161	175	58	52	3.1	2.8	238.4	270.4	1.1	202.4	228.6	1.1	182.3	195.5	1.1	6	7	26	40	182-238	
1016-35	Mossop, Table 4	Cnut All (Lincoln)	3760	1111	1433	418	595	3.4	2.6	1577.0	2315.5	1.5	1348.6	1944.9	1.4	1250.0	1702.4	1.4	42	19	66	38	693-935	

Dates*	Data source	Type	n	do	dr	F1o	F1r	n/do	n/dr	Esty Do	Esty Dr	Esty Do:Dr	Carter Do	Carter Dr	Carter Do:Dr	Good Do	Good Dr	Good Do:Dr	t low	t high	Do/t lowest	Do/t highest	Range Do	Notes
c.1029-35/6	Lyon	Cnut Short Cross (Win)	176	44	64	10	23	4.0	2.8	58.7	100.6	1.7	55.7	84.8	1.5	46.7	73.6	1.6	6	6	8	10	47-59	
c.1029-35/6	Lyon	Cnut Short Cross (Yor)	564	98	122	19	24	5.8	4.6	118.6	155.7	1.3	112.7	147.9	1.3	101.4	127.4	1.3	6	6	17	20	101-119	
c.1036-8	Mossop, Table 4	Hal Jewel Cross (Lin)	166	76	91	35	46	2.2	1.8	140.2	201.4	1.4	115.5	114.1	1.0	96.3	125.9	1.3	2	2	48	70	96-140	
c.1036-8	Lyon	Hal Jewel Cross (Win)	63	32	35	18	20	2.0	1.8	65.0	78.8	1.2	52.7	52.8	1.0	44.8	51.3	1.1	2	2	22	33	45-65	
c.1036-8	Lyon	Hal Jewel Cross (Yor)	156	52	58	15	23	3.0	2.7	78.0	92.3	1.2	66.0	77.7	1.2	57.5	68.0	1.2	2	2	29	39	58-78	
1038-40	Mossop, Table 4	Hal Fleur de Lis (Lin)	156	75	81	43	47	2.1	1.9	144.4	168.5	1.2	118.2	117.5	1.0	103.5	115.9	1.1	2	2	52	72	104-144	
1035-40	Mossop, Table 4	Harold I All (Lincoln)	541	235	265	111	136	2.3	2.0	415.5	519.4	1.3	344.7	338.6	1.0	295.7	354.0	1.2	4	5	59	104	199-284	
1038-40	Lyon	Hal Fleur de Lis (Win)	73	26	32	10	12	2.8	2.3	40.4	57.0	1.4	34.2	33.0	1.0	30.1	38.3	1.3	2	2	15	20	30-40	
1038-40	Lyon	Hal Fleur de Lis (Yor)	190	44	51	6	11	4.3	3.7	57.3	69.7	1.2	54.4	60.5	1.1	45.4	54.1	1.2	2	2	23	29	45-57	
1040-42	Mossop, Table 4	Hcnt Arm and Sceptre (Lin)	100	51	51	26	29	2.0	2.0	104.1	104.1	1.0	84.3	84.2	1.0	68.9	71.8	1.0	2	2	34	52	69-104	
1040-42	Lyon	Hcnt Arm and Sceptre (Win)	54	34	36	22	26	1.6	1.5	91.8	108.0	1.2	73.9	73.9	1.0	57.4	69.4	1.2	2	2	29	46	57-92	
1040-42	Lyon	Hcnt Arm and Sceptre (Yor)	83	27	30	7	12	3.1	2.8	40.0	47.0	1.2	34.0	32.7	1.0	29.5	35.1	1.2	2	2	15	20	30-40	
1042-4	Mossop, Table 4	Edw Pacx (Lincoln)	89	46	52	23	33	1.9	1.7	95.2	125.1	1.3	77.3	77.3	1.0	62.0	82.6	1.3	2	2	31	48	62-95	
1042-4	Lyon	Edw Pacx (Win)	38	22	27	12	19	1.7	1.4	52.3	93.3	1.8	42.2	42.2	1.0	32.2	54.0	1.7	2	2	16	26	32-52	
1042-4	Lyon	Edw Pacx (Yor)	48	24	29	10	16	2.0	1.7	48.0	73.3	1.5	42.4	39.0	0.9	30.3	43.5	1.4	2	2	15	24	30-48	
1044-6	Mossop, Table 4	Edw Radiate Small Cross (Lin)	96	40	51	13	19	2.4	1.9	68.6	108.8	1.6	60.7	55.9	0.9	46.3	63.6	1.4	2	2	23	34	46-69	
1044-6	Lyon	Edw Radiate Small Cross (Win)	51	28	29	16	17	1.8	1.8	62.1	67.2	1.1	50.3	50.3	1.0	40.8	43.5	1.1	2	2	20	31	41-62	
1044-6	Lyon	Edw Radiate Small Cross (Yor)	193	62	73	21	30	3.1	2.6	91.3	117.4	1.3	77.7	74.7	1.0	69.6	86.4	1.2	2	2	35	46	70-91	
1046-8	Mossop, Table 4	Edward Trefoil Quatrefoil (Lin)	101	63	59	40	33	1.6	1.7	167.4	141.9	0.8	134.8	134.8	1.0	104.3	87.6	0.8	4	4	26	42	104-167	
1046-8	Lyon	Edw Trefoil Quatrefoil (Win)	35	21	24	15	18	1.7	1.5	52.5	76.4	1.5	42.4	42.4	1.0	36.8	49.4	1.3	2	2	18	26	37-53	
1046-8	Lyon	Edw Trefoil Quatrefoil (Yor)	142	44	50	9	19	3.2	2.8	63.8	77.2	1.2	54.5	52.2	1.0	47.0	57.7	1.2	2	2	23	32	47-64	
1048-50	Mossop, Table 4	Edw Short Cross (Lin)	47	24	21	11	8	2.0	2.2	49.0	38.0	0.8	39.7	39.7	1.0	31.3	25.3	0.8	2	2	16	25	31-49	
1048-50	Lyon	Edw Short Cross (Win)	39	31	28	25	20	1.3	1.4	151.1	99.3	0.7	118.1	118.1	1.0	86.4	57.5	0.7	2	2	43	76	86-151	
1048-50	Lyon	Edw Short Cross (Yor)	96	21	26	3	5	4.6	3.7	26.9	35.7	1.3	25.5	30.9	1.2	21.7	27.4	1.3	2	2	11	13	22-27	
1050-3	Mossop, Table 4	Edw Expanding Cross Light (Lin)	41	27	25	17	11	1.5	1.6	79.1	64.1	0.8	63.4	63.4	1.0	46.1	34.2	0.7	3	3	15	26	46-79	
1050-3	Lyon	Edw Expanding Cross Light (Win)	22	19	19	16	16	1.2	1.2	139.3	139.3	1.0	105.4	105.4	1.0	69.7	69.7	1.0	3	3	23	46	70-139	
1050-3	Lyon	Edw Expanding Cross Light (Yor)	112	33	46	8	19	3.4	2.4	46.8	78.1	1.7	40.2	38.3	1.0	35.5	55.4	1.6	3	3	12	16	36-47	
1050-3	Mossop, Table 4	Edw Expanding Cross Heavy (Lin)	96	26	36	6	13	3.7	2.7	35.7	57.6	1.6	30.9	30.6	1.0	27.7	41.6	1.5	3	3	9	12	28-36	

Dates*	Data source	Type	n	do	dr	F1o	F1r	n/do	n/dr	Esty Do	Esty Dr	Esty Do:Dr	Carter Do	Carter Dr	Carter Do:Dr	Good Do	Good Dr	Good Do:Dr	t low	t high	Do/t lowest	Do/t highest	Range Do	Notes
1050-3	Lyon	Edw Expanding Cross Heavy (Win)	46	20	18	10	7	2.3	2.6	35.4	29.6	0.8	35.0	29.3	0.8	25.6	21.2	0.8	3	3	9	12	26-35	
1050-3	Lyon	Edw Expanding Cross Heavy (Yor)	81	23	30	6	12	3.5	2.7	32.1	47.6	1.5	27.7	27.5	1.0	24.8	35.2	1.4	3	3	8	11	25-32	
1053-6	Mossop, Table 4	Edw Pointed Helmet (Lin)	57	35	34	23	22	1.6	1.7	90.7	84.3	0.9	73.1	73.1	1.0	58.7	55.4	0.9	3	3	20	30	59-91	
1053-6	Lyon	Edw Pointed Helmet (Win)	95	42	58	18	36	2.3	1.6	75.3	148.9	2.0	74.6	61.3	0.8	51.8	93.4	1.8	3	3	17	25	52-75	
1053-6	Lyon	Edw Pointed Helmet (Yor)	204	45	55	6	16	4.5	3.7	57.7	75.3	1.3	54.8	65.3	1.2	46.4	59.7	1.3	3	3	15	19	46-58	
1056-9	Mossop, Table 4	Edw Sovereign Eagles (Lin)	30	23	24	19	20	1.3	1.3	98.6	120.0	1.2	77.6	77.6	1.0	62.7	72.0	1.1	3	3	21	33	63-99	
1056-9	Lyon	Edw Sovereign Eagles (Win)	54	26	36	14	25	2.1	1.5	50.1	108.0	2.2	49.7	40.8	0.8	35.1	67.0	1.9	3	3	12	17	35-50	
1056-9	Lyon	Edw Sovereign Eagles (Yor)	109	30	48	4	22	3.6	2.3	41.4	85.8	2.1	35.8	35.5	1.0	31.1	60.1	1.9	3	3	10	14	31-41	
1059-62	Mossop, Table 4	Edw Hammer Cross (Lin)	74	44	44	25	26	1.7	1.7	108.5	108.5	1.0	87.6	87.6	1.0	66.4	67.8	1.0	3	3	22	36	66-109	
1059-62	Lyon	Edw Hammer Cross (Win)	58	31	33	18	16	1.9	1.8	66.6	76.6	1.1	54.0	54.0	1.0	45.0	45.6	1.0	3	3	15	22	45-67	
1059-62	Lyon	Edw Hammer Cross (Yor)	225	48	67	10	17	4.7	3.4	61.0	95.4	1.6	58.0	81.9	1.4	50.2	72.5	1.4	3	3	17	20	50-61	
1062-5	Mossop, Table 4	Edw Facing Small Cross (Lin)	37	23	24	14	16	1.6	1.5	60.8	68.3	1.1	48.9	48.9	1.0	37.0	42.3	1.1	3	3	12	20	37-61	
1062-5	Lyon	Edw Facing Small Cross (Win)	31	18	17	12	9	1.7	1.8	42.9	37.6	0.9	34.7	34.7	1.0	29.4	24.0	0.8	3	3	10	14	29-43	
1062-5	Lyon	Edw Facing Small Cross (Yor)	283	64	83	15	23	4.4	3.4	82.7	117.4	1.4	72.9	101.0	1.4	67.6	90.3	1.3	3	3	23	28	68-83	
1065-6	Mossop, Table 4	Edw Pyramids (Lin)	20	14	14	8	8	1.4	1.4	46.7	46.7	1.0	37.2	37.2	1.0	23.3	23.3	1.0	1	1	23	47	23-47	
1042-66	Mossop, Table 4	Edward All (Lincoln)	2650	1017	1180	447	571	2.6	2.2	1650.4	2127.2	1.3	1347.7	1347.7	1.0	1223.4	1504.1	1.2	24	24	51	69	514-778	
1065-6	Lyon	Edw Pyramids (Win)	65	31	34	14	15	2.1	1.9	59.3	71.3	1.2	48.6	48.2	1.0	39.5	44.2	1.1	1	1	40	59	40-59	
1065-6	Lyon	Edw Pyramids (Yor)	188	27	41	5	7	7.0	4.6	31.5	52.4	1.7	30.0	49.8	1.7	27.7	42.6	1.5	1	1	28	32	28-32	
1066 Mossop, Table 4		Hall Pax (Lin)	30	13	14	5	4	2.3	2.1	22.9	26.3	1.1	19.0	19.0	1.0	15.6	16.2	1.0	1	1	16	23	16-23	
1066 Lyon		Hall Pax (Win)	24	11	14	6	11	2.2	1.7	20.3	33.6	1.7	16.7	16.5	1.0	14.7	25.8	1.8	1	1	15	20	15-20	
1066 Lyon		Hall Pax (Yor)	68	14	21	2	7	4.9	3.2	17.6	30.4	1.7	16.7	26.0	1.6	14.4	23.4	1.6	1	1	14	18	14-18	
1066-8	Mossop, Table 4	WI Cross Fleury (Lin)	10	6	5	2	3	1.7	2.0	15.0	10.0	0.7	12.1	11.7	1.0	7.5	7.1	1.0	2	2	4	8	8-15	
1066-8	Lyon	WI Cross Fleury (Win)	38	19	25	9	14	2.0	1.5	38.0	73.1	1.9	30.9	30.9	1.0	24.9	39.6	1.6	2	2	12	19	25-38	
1066-8	Lyon	WI Cross Fleury (Yor)	15	7	8	3	4	2.1	1.9	13.1	17.1	1.3	10.8	10.7	1.0	8.8	10.9	1.2	2	2	4	7	9-13	
1068-70	Mossop, Table 4	WI Bonnet (Lin)	49	18	23	3	8	2.7	2.1	28.5	43.3	1.5	24.0	24.0	1.0	19.2	27.5	1.4	2	2	10	14	19-29	
1068-70	Lyon	WI Bonnet (Win)	10	9	8	6	6	1.1	1.3	90.0	40.0	0.4	65.8	65.8	1.0	22.5	20.0	0.9	2	2	11	45	23-90	
1068-70	Lyon	WI Bonnet (Yor)	156	12	17	1	3	13.0	9.2	13.0	19.1	1.5	12.4	18.1	1.5	12.1	17.3	1.4	2	2	6	7	12-13	
1070-2	Lyon	WI Canopy (Lin)	6	4	6	2	6	1.5	1.0	12.0	-	-	9.6	9.6	1.0	6.0	-	-	2	2	3	6	6-12	
1070-2	Lyon	WI Canopy (Win)	16	13	14	11	12	1.2	1.1	69.3	112.0	1.6	53.8	53.8	1.0	41.6	56.0	1.3	2	2	21	35	53-69	
1070-2	Lyon	WI Canopy (Yor)	2	1	1	1	1	2.0	2.0	2.0	2.0	1.0	1.6	1.6	1.0	2.0	2.0	1.0	2	2	1	1	2	
1072-4	Lyon	WI Sceptres (Lin)	35	14	18	7	11	2.5	1.9	23.3	37.1	1.6	19.5	19.0	1.0	17.5	26.3	1.5	2	2	9	12	18-23	

Dates*	Data source	Type	n	do	dr	F1o	F1r	n/do	n/dr	Esty Do	Esty Dr	Esty Do:Dr	Carter Do	Carter Dr	Carter Do:Dr	Good Do	Good Dr	Good Do:Dr	t low	t high	Do/t lowest	Do/t highest	Range Do	Notes
1072-4	Lyon	WI Sceptres (Win)	13	8	10	6	9	1.6	1.3	20.8	43.3	2.1	16.8	16.8	1.0	14.9	32.5	2.2	2	2	7	10	15-20	
1072-4	Lyon	WI Sceptres (Yor)	31	8	13	2	4	3.9	2.4	10.8	22.4	2.1	9.4	9.3	1.0	8.6	14.9	1.7	2	2	4	5	9-11	
1074-7	Lyon	WI Stars (Lin)	36	9	20	12	14	4.0	1.8	12.0	45.0	3.8	11.4	9.8	0.9	13.5	32.7	2.4	3	3	4	5	11-14	
1074-7	Lyon	WI Stars (Win)	23	20	20	18	19	1.2	1.2	153.3	153.3	1.0	115.5	115.5	1.0	92.0	115.0	1.3	3	3	31	51	92-153	
1074-7	Lyon	WI Stars (Yor)	30	4	9	0	3	7.5	3.3	4.6	12.9	2.8	4.4	11.0	2.5	4.0	10.0	2.5	3	3	1	2	4-5	
1077-80	Lyon	WI Sword (Lin)	7	5	5	3	3	1.4	1.4	17.5	17.5	1.0	13.9	13.9	1.0	8.8	8.8	1.0	3	3	3	6	9-18	
1077-80	Lyon	WI Sword (Win)	26	10	12	4	4	2.6	2.2	16.3	22.3	1.4	13.7	13.6	1.0	11.8	14.2	1.2	3	3	4	5	12-16	
1077-80	Lyon	WI Sword (Yor)	14	6	7	2	3	2.3	2.0	10.5	14.0	1.3	8.7	8.7	1.0	7.0	8.9	1.3	3	3	2	4	7-11	
1080-3	Lyon	WI Profile Cross Trefoils (Lin)	1	1	1	1	1	1.0	1.0	-	-	-	58.8	58.8	1.0	-	-	-	3	3	20	20	59	
1080-3	Lyon	WI Profile Cross Trefoils (Win)	16	9	11	6	8	1.8	1.5	20.6	35.2	1.7	16.3	16.6	1.0	14.4	22.0	1.5	3	3	5	7	14-21	
1080-3	Lyon	WI Profile Cross Trefoils (Yor)	2	1	1	0	0	2.0	2.0	2.0	2.0	1.0	1.6	1.6	1.0	1.0	1.0	1.0	3	3	0	1	1-2	
1083-6	Mossop, Table 4	WI Pacx (Lin)	72	12	17	0	2	6.0	4.2	14.4	22.3	1.5	13.7	0.1	0.0	12.0	17.5	1.5	3	3	4	5	12-14	
1083-6	Lyon	WI Pacx (Win)	264	51	65	12	16	5.2	4.1	63.2	86.2	1.4	60.1	0.0	0.0	53.4	69.2	1.3	3	3	18	21	53	
1083-6	Lyon	WI Pacx (Yor)	37	4	6	1	0	9.3	6.2	4.5	7.2	1.6	4.3	0.3	0.1	4.1	6.0	1.5	3	3	1	1	4-5	
1086-9	Lyon	WII Profile (Lin)	6	6	5	6	4	1.0	1.2	-	30.0	-	56.1	352.9	6.3	-	15.0	-	3	3	19	19	56	
1086-9	Lyon	WII Profile (Win)	17	10	15	5	13	1.7	1.1	24.3	127.5	5.3	19.6	19.6	1.0	14.2	63.8	4.5	3	3	5	8	14-24	
1086-9	Lyon	WII Profile (Yor)	1	1	1	1	1	1.0	1.0	-	-	-	58.8	58.8	1.0	-	-	-	3	3	20	20	59	
1089-92	Lyon	WII Cross in Quatrefoil (Lin)	10	5	7	4	6	2.0	1.4	10.0	23.3	2.3	8.1	8.1	1.0	8.3	17.5	2.1	3	3	3	3	8-10	
1089-92	Lyon	WII Cross in Quatrefoil (Win)	9	6	7	4	5	1.5	1.3	18.0	31.5	1.8	14.4	14.4	1.0	10.8	15.8	1.5	3	3	4	6	10-18	
1089-92	Lyon	WII Cross in Quatrefoil (Yor)	5	2	2	0	0	2.5	2.5	3.3	3.3	1.0	2.8	2.8	1.0	2.0	2.0	1.0	3	3	1	1	2-3	
1092-5	Lyon	WII Voided Cross (Lin)	24	14	13	9	9	1.7	1.8	33.6	28.4	0.8	27.1	27.1	1.0	22.4	20.8	0.9	3	3	7	11	22-34	
1092-5	Lyon	WII Voided Cross (Win)	7	7	7	7	7	1.0	1.0	-	-	-	411.8	411.8	1.0	-	-	-	3	3	137	137	412	
1092-5	Lyon	WII Voided Cross (Yor)	6	3	3	1	1	2.0	2.0	6.0	6.0	1.0	4.9	4.9	1.0	3.6	3.6	1.0	3	3	1	2	4-6	
1095-100	Lyon	WII Cross Fleury & Piles/Pattee and Fleury (Lin)	5	5	5	5	5	1.0	1.0	-	-	-	294.1	294.1	1.0	-	-	-	5	5	59	59	294	
1095-100	Lyon	WII Cross Fleury & Piles/Pattee and Fleury (Win)	6	6	6	6	6	1.0	1.0	-	-	-	352.9	352.9	1.0	-	-	-	5	5	71	71	353	
1095-100	Lyon	WII Cross Fleury & Piles/Pattee and Fleury (Yor)	2	2	2	2	2	1.0	1.0	-	-	-	117.6	117.6	1.0	-	-	-	5	5	24	24	118	
1100-35	Mossop, Table 4	HI (all) (Lin)	31	26	26	23	23	1.2	1.2	161.2	161.2	1.0	123.8	123.8	1.0	100.8	100.8	1.0	35	35	3	5	101-161	
	1100 Lyon	HI BMC i (Lin)	3	3	3	3	3	1.0	1.0	-	-	-	176.5	176.5	1.0	-	-	-	1	1	176	176	176	
	1100 Lyon	HI BMC i (Win)	5	4	5	3	5	1.3	1.0	20.0	-	-	15.6	15.6	1.0	10.0	-	-	1	1	10	20	10-20	
	1100 Lyon	HI BMC i (Yor)	1	1	1	1	1	1.0	1.0	-	-	-	58.8	58.8	1.0	-	-	-	1	1	59	59	59	
c.1102-15	Lyon	HI BMC ii-ix, xi (Lin)	15	unp	unp	unp	unp	-	-	-	-	-	-	-	-	-	-	-	13	13	-	-	-	
c.1102-15	Lyon	HI BMC ii-ix, xi (Win)	30	29	29	28	28	1.0	1.0	870.0	870.0	1.0	509.7	509.7	1.0	435.0	435.0	1.0	13	13	33	67	435-870	
c.1102-15	Lyon	HI BMC ii-ix, xi (Yor)	10	8	8	6	6	1.3	1.3	40.0	40.0	1.0	31.2	31.2	1.0	20.0	20.0	1.0	13	13	2	3	20-40	

Dates*	Data source	Type	n	do	dr	F1o	F1r	n/do	n/dr	Esty Do	Esty Dr	Esty Do:Dr	Carter Do	Carter Dr	Carter Do:Dr	Good Do	Good Dr	Good Do:Dr	t low	t high	Do/t lowest	Do/t highest	Range Do	Notes
c.1117	Lyon	HI BMC x (Lin)	19	unp	unp	unp	unp	-	-	-	-	-	-	-	-	-	-	-	1	2	-	-	-	
c.1117	Lyon	HI BMC x (Win)	24	19	19	15	15	1.3	1.3	91.2	91.2	1.0	71.3	71.3	1.0	50.7	50.7	1.0	1	2	25	91	51-91	
c.1117	Lyon	HI BMC x (Yor)	11	5	5	2	2	2.2	2.2	9.2	9.2	1.0	7.6	7.6	1.0	6.1	6.1	1.0	1	2	3	9	6-9	
c.1119	Lyon	HI BMC xii (Lin)	1	1	1	1	1	1.0	1.0	-	-	-	58.8	58.8	1.0	-	-	-	1	2	29	59	59	
c.1119	Lyon	HI BMC xii (Win)	1	1	1	1	1	1.0	1.0	-	-	-	58.8	58.8	1.0	-	-	-	1	2	29	59	59	
c.1119	Lyon	HI BMC xii (Yor)	1	1	1	1	1	1.0	1.0	-	-	-	58.8	58.8	1.0	-	-	-	1	2	29	59	59	
c.1121	Lyon	HI BMC xiii (Lin)	17	unp	unp	unp	unp	-	-	-	-	-	-	-	-	-	-	-	1	2	-	-	-	
c.1121	Lyon	HI BMC xiii (Win)	13	10	13	8	13	1.3	1.0	43.3	-	-	34.1	34.1	1.0	26.0	-	-	1	2	13	43	26-43	
c.1121	Lyon	HI BMC xiii (Yor)	13	4	4	2	2	3.3	3.3	5.8	5.8	1.0	4.9	4.9	1.0	4.7	4.7	1.0	1	2	2	6	5-6	
c.1123	Lyon	HI BMC xiv (Lin)	28	unp	unp	unp	unp	-	-	-	-	-	-	-	-	-	-	-	1	2	-	-	-	
c.1123	Lyon	HI BMC xiv (Win)	41	22	23	9	12	1.9	1.8	47.5	52.4	1.1	38.5	38.5	1.0	28.2	32.5	1.2	1	2	14	47	28-48	
c.1123	Lyon	HI BMC xiv (Yor)	20	8	8	3	3	2.5	2.5	13.3	13.3	1.0	11.2	11.1	1.0	9.4	9.4	1.0	1	2	5	13	9-13	
1125-c.1135	Lyon	HI BMC xv (Lin)	20	unp	unp	unp	unp	-	-	-	-	-	-	-	-	-	-	-	10	10	-	-	-	
1125-c.1135	Lyon	HI BMC xv (Win)	72	51	47	39	33	1.4	1.5	174.9	135.4	0.8	139.3	139.3	1.0	111.3	86.8	0.8	10	10	11	17	111-175	
1125-c.1135	Lyon	HI BMC xv (Yor)	27	10	9	3	1	2.7	3.0	15.9	13.5	0.9	13.4	11.4	0.9	11.3	9.3	0.8	10	10	1	2	11-16	
c.1136-45	Mossop, Table 4	Ste BMC i (Lin)	95	28	28	9	9	3.4	3.4	39.7	39.7	1.0	37.7	34.1	0.9	30.9	30.9	1.0	9	9	3	4	31-40	
c.1136-45	Lyon	Ste BMC i (Win)	100	47	42	25	23	2.1	2.4	88.7	72.4	0.8	72.8	72.7	1.0	62.7	54.5	0.9	9	9	7	10	63-89	
c.1136-45	Lyon	Ste BMC i (Yor)	110	15	15	3	3	7.3	7.3	17.4	17.4	1.0	16.5	0.1	0.0	15.4	15.4	1.0	9	9	2	2	15-17	
c.1145-58	Lyon	Ste BMC ii-vii (Lin)	9	6	6	5	5	1.5	1.5	18.0	18.0	1.0	14.4	14.4	1.0	13.5	13.5	1.0	14	14	1	1	14-18	
1135-54	Lyon	Stephen All (Lincoln)	314	96	91	42	40	3.3	3.5	138.3	128.1	0.9	118.0	118.0	1.0	110.8	104.3	0.9	19	20	6	7	47-60	
c.1145-58	Lyon	Ste BMC ii-vii (Win)	2	1	2	0	2	2.0	1.0	2.0	-	-	1.6	1.6	1.0	1.0	-	-	14	14	0	0	1-2	
c.1145-58	Lyon	Ste BMC ii-vii (Yor)	8	7	7	6	5	1.1	1.1	56.0	56.0	1.0	42.0	42.0	1.0	28.0	18.7	0.7	14	14	2	4	28-56	
c.1136-54	Lyon	Ste Other (Lin)	6	5	4	5	4	1.2	1.5	30.0	12.0	0.4	23.1	23.1	1.0	30.0	12.0	0.4	18	18	1	2	23-30	
c.1136-54	Lyon	Ste Other (Yor)	88	38	42	27	34	2.3	2.1	66.9	80.3	1.2	55.5	55.5	1.0	54.8	68.4	1.2	18	18	3	3	55-67	
1158-80	Mossop, Table 4	HII Tealby (Lin)	168	58	59	20	19	2.9	2.8	88.6	90.9	1.0	75.1	75.0	1.0	65.8	66.5	1.0	22	22	3	4	66-89	
1158-80	Lyon	HII Tealby (Win)	73	27	26	9	8	2.7	2.8	42.8	40.4	0.9	36.1	36.1	1.0	30.8	29.2	0.9	22	22	1	2	31-43	
1158-80	Lyon	HII Tealby (Yor)	105	22	22	4	4	4.8	4.8	27.8	27.8	1.0	26.4	0.1	0.0	22.9	22.9	1.0	22	22	1	1	23-28	

* All dating taken from J.J. North, *English Hammered Coinage: Volume 1, Early Anglo-Saxon England to Henry III, c.600-1272*, 3rd edn (London: Spink & Son, 1994).

Except for Regal coins as Cuerdale is now thought to have been desposited c.905 giving a TPQ for this coinage; and the Swordless St Peter type whose issue is now thought to span until Ragnald's arrival in York c.919.

Abbreviation	Meaning	Discussion
n	Number of extant coins in the corpus	
d	number of extant dies in the corpus	
do	number of extant obverse dies in the corpus	The number of obverse dies is more stable as they wore out less frequently
dr	number of extant reverse dies in the corpus	
d ₁	Die which is represented in only one coin	Sometimes called a Singleton, F1
d ₂	Die which is represented in only two coins	Sometimes called a Doubleton
e	The point estimate of the number of dies	
n/do	Number of coins divided by the number of obverse dies	The n/do is often used rather than n/dr as the obverse dies were more stable
n/dr	Number of coins divided by the number of reverse dies	
C	Coverage	The number of coins struck by coins represented in the sample divided by the number of coins struck by all the dies.
D	Postulated number of dies which originally existed	This is the number that the formulae below try to calculate
Do	Postulated number of obverse dies which originally existed	
Dr	Postulated number of reverse dies which originally existed	
F1	Die which is represented in only one coin	Sometimes called a Singleton, also known as d ₁
F1o	Obverse die which is represented in only one coin	Sometimes called a Singleton, also known as d ₁
F1r	Reverse die which is represented in only one coin	Sometimes called a Singleton, also known as d ₁
Do:Dr	Ratio of obverse to reverse dies	The number of obverse dies is generally much lower than reverse as the reverse die wore out quicker
t	Time in years	
Do/t	Number of obverse dies made per year	This is often expressed as a range taking the highest Do estimate from Good, Carter and Esty and the shortest number of years, and the lowest estimate with the highest number of years.
N	Postulated number of coins which originally existed	This will not be calculated as there are too many variables and no K, making Do or Do/t the most important figure for comparison rather than N.
K	Constant: the number of coins struck per die	Since the number of coins thought to be struck per die is not a constant (K) we cannot use this
unp	data not published or recorded and not available for this analysis	
-	data is insufficient to give a figure for this calculation	
*	Reverse die data only (not obverse as with the other data)	

Monarch Key

Æthr	Æthelred the Unready
Aths	Athelstan
Eadw	Eadwig
Edg	Edgar
Edw	Edward the Confessor
Guth	Guthrum
HI	Henry I
III	Henry II
Hal	Harold I
Hall	Harold II
Hcnt	Harthacnut
Rag	Ragnall
Slp	Swordless St Peter
Ste	Stephen
WI	William I
WII	William II

Mints Key

Lin	Lincoln
Win	Winchester
Yor	York

Formulae

Esty		$D = nd/n-d$
Good		$D = nd/n-F1$
Carter	If $n/d = <2$	$D = nd/(1.214n - 1.197d)$
	If $n/d = >2$ and <3	$D = nd/(1.0124n - 1.016d)$
	If $n/d = >3$	$D = nd/(1.069n - 0.843d)$
	If $n/d >4$	$D = 0.95nd/(n-d)$
Esty 2006*	1. Estimate coverage	$C = 1 - d_1/n$
	2. Estimate D	$D = (d/C_{est})(1+d_1/2d)$
	3. Estimate D (where no d_1 is given)	$D_2 = 2n/(n/d)-4+\sqrt{8(n/d)+(n/d)^2}$
	4. Confidence intervals	$e+(2e/n)^2 \pm (2e/n)\sqrt{2e}$
	5. Coverage	$C \pm (2/n)\sqrt{d_1 + 2d_2 - (d_1^2/n)}$

*This equation is not used here, but has been used by other scholars such as Lyon and Naismith.

Works Cited

- Blackburn, 2005 M.A.S. Blackburn, 'Presidential Address 2004, Currency under the Vikings, Part 1: Guthrum and the Earliest Danelaw Coinages', *British Numismatic Journal*, 75 (2005), 18-43.
- Blackburn, 2006 M.A.S. Blackburn, 'Presidential Address 2005, Currency under the Vikings, Part 2: The Two Scandinavian Kingdoms of the Danelaw, c. 895-954', *British Numismatic Journal*, 76 (2006), 204-26.
- Blunt & Stewart C.E. Blunt and B.H.I.H. Stewart, 'The Coinage of Regnald I of York and the Bossall Hoard', *Numismatic Chronicle*, 143 (1983), 146-63.
- Carter G.F. Carter, 'A Simplified Methods for Calculating the Original Number of Dies from Die Link Statistics', *American Numismatic Society, Museum Notes* (1983), 195-206.
- CTCE C.E. Blunt, B.H.I.H. Stewart and C.S.S. Lyon, *Coinage in Tenth Century England: From Edward the Elder to Edgar's Reform* (Oxford: Published for the British Academy by Oxford University Press, 1989).
- Esty Formula in W.W. Esty 'Estimation of the Size of a Coinage: A Survey and Comparison of Methods', *Numismatic Chronicle*, 146 (1986), 185-215.
- Esty 2006 W.W. Esty, 'How to Estimate the Original Number of Dies and the Coverage of a Sample', *Numismatic Chronicle*, 166 (2006), 359-64.
- Gooch Die study undertaken by Megan Gooch
- Good Formula in W.W. Esty 'Estimation of the Size of a Coinage: A Survey and Comparison of Methods', *Numismatic Chronicle*, 146 (1986), 185-215.
- Lyon C.S.S. Lyon, 'Minting in Winchester: An Introduction and Statistical Analysis', in *The Winchester Mint and Coins and Related Finds from the Excavations of 1961-71*, ed. by M. Biddle, Winchester Studies, 8 (Oxford: Clarendon Press, forthcoming), pp. 3-54.
- Lyon & Stewart C.S.S. Lyon and B.H.I.H. Stewart, 'The Classification of Northumbrian Viking Coins in the Cuerdale Hoard', *Numismatic Chronicle*, 7th ser., 4 (1964), 281-2.
- Mossop H.R. Mossop, *The Lincoln Mint, c.890-1279* (Newcastle-upon-Tyne: Corbitt & Hunter, 1970).
- Malmer B. Malmer, *The Anglo-Scandinavian Coinage c.995-1020*, Commentationes de Nummis Saeculorum IX-XI in Sueca Repertis, Nova Series, 9 (Stockholm: Royal Swedish Academy of Letters, History and Antiquities, 1997).
- Naismith R. Naismith, 'Coinage and History in Southumbrian England, c.750-865' (unpublished doctoral thesis, University of Cambridge, 2009).

Appendix IV: Gazetteer of Tenth Century Coin Hoards

This gazetteer contains coin and non-coin hoards from the birth of coinage in the Viking kingdom of York c.895 onwards, and covers hoards dated from this period up to c.975. This date is chosen as it is the date when there was a major Anglo-Saxon recoinage under Edgar, but mainly because it is a useful terminus for this study, as it is the useful major date after the fall of an independent Viking York in 954, and extends the time frame beyond 954 as many hoards still contained York Viking coins. However, any later or uncertain tenth-century hoards which contain Northern Danelaw material are included.

All hoards are cross-referenced with their numbers from J.D.A. Thompson, *Inventory of British Coin Hoards, AD 600-1500* (Oxford: Oxford University Press, 1956) and the Fitzwilliam Museum's *Checklist of Coin Hoards*, where they exist.

1. Ashdon

Essex, discovered in 1984.

Deposited c.895

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Alfred	1	871-899
Southern Danelaw	Guthrum	5	880-890
	(Æthelstan)		
	Alfred imitation	28	
Northern Danelaw	Guthfrith	1	c.883-895
Uncertain	Anglo-Saxon or Viking	32	
Carolingian	Charles the Bald	3	840-877
	Odo	1	888-898
Hacksilver and ornaments			
	TOTAL coins	71	

Bibliography

Fitzwilliam Museum, *Checklist*, number 84.

Blackburn, M.A.S, 'The Ashdon (Essex) Hoard and the Currency of the Southern Danelaw in the late Ninth Century', *British Numismatic Journal*, 59 (1989), 13-38.

2. Stamford

Lincolnshire

Deposited c.901

Discovery

Discovered on the 25th August 1902 whilst a workman was digging sewage trenches in St Leonard's Street, Stamford.¹

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Alfred	10 (+ 9-11 others)	871-99
Southern Danelaw	Alfred Imitation	1	c.871-99
Northern Danelaw	Regal	1-2	c.895-c.905
Carolingian	Charles the Bald	1	839-77
Hacksilver and ornaments	-	-	-
TOTAL coins		13-25	

Dispersal

Fifteen coins were forwarded to the British Museum for inspection. Twelve to fourteen others are assumed to have been sold into private collections, as when the landowner was approached by police he said he had lost them on journey from London to Stamford.²

Bibliography

Fitzwilliam Museum, *Checklist*, number 85.

Thompson, number 339.

Grueber, H.A., 'A Find of Coins of Alfred the Great at Stamford', *Numismatic Chronicle*, 3rd Ser., 4, (1903), 347-355.

3. Nottingham

Nottinghamshire, discovered in 1693.

Deposited after 901

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Edward the Elder	1	899-924
Hacksilver and ornaments	-	-	-
TOTAL coins		1 or more	

¹ H.A. Grueber, 'A Find of Coins of Alfred the Great at Stamford', *Numismatic Chronicle*, 4, 3rd Ser. (1903), 347.

² Grueber, 'Coins of Alfred the Great at Stamford', 348.

Dispersal

This coin is said by Thoresby to have been found ‘with many others’ but there are no records as to the other coins in the hoard.

Bibliography

Fitzwilliam Museum, *Checklist*, number 102.

Thompson, number 239.

Thoresby, R., *Ducatus Leodiensis; or, the Topography of the Ancient and Populous Town and Parish of Leedes ... To which is added...a Catalogue of his Museum...particularly the Roman, British, Saxon, Danish, Norman and Scotch Coins, with Modern medals &c.* (Leeds: B. Dewhirst, 1816).

4. Cuerdale

Lancashire

Deposited c.903-905

The Cuerdale hoard is the largest and most famous hoard of the Viking period in England, whose vast contents have dominated the study of Viking coins for over a century and a half. Some have even estimated that some 99% of extant early Viking coins come from this hoard.³

Discovery

The hoard was discovered on the 15th May 1840 when workmen who were digging for embankment repairs on the River Ribble after a bout of fierce rain, hit some coins with their shovels near Cuerdale Hall. The coins, minus some which curious workmen may have taken, or were paid with, were then taken by the landowner’s steward and deposited in Cuerdale Hall.

Some of the collection was then taken to the Preston Bank to await the return of the landowner William Assheton from Italy, and for Treasure Trove proceedings. An account was written by Edward Hawkins at the British Museum in 1843 which listed the coins in the hoard which were known to him, but it seems that this list excludes a parcel taken by the collector, Joseph Kenyon whilst Assheton was still abroad,⁴ although this unrecorded parcel has been reconstructed to some extent by later scholars.⁵ For the time, Hawkins’ account was thorough and reflects the author’s areas of interests and specialities, but for the modern scholar it is infuriatingly incomplete, and a complete die study is quite impossible.⁶ Work undertaken over the last century and a half has added to our understanding of the nature and contents of the hoard, and a definitive volume on the hoard is due for publication in 2012.⁷

³ Lyon and Stewart, ‘Northumbrian Viking Coinage’, p. 97.

⁴ C.E. Blunt, ‘The Composition of the Cuerdale Hoard’, *British Numismatic Journal*, 53 (1983), 1-3.

⁵ Blunt, ‘Composition of the Cuerdale Hoard’, 1-6; J. Graham Campbell, ‘The Cuerdale Hoard: A Viking and Victorian Treasure’, in *Viking Treasure from the North West: The Cuerdale Hoard in its Context*, ed. by J. Graham Campbell (Liverpool Museum: National Museums and Galleries on Merseyside Occasional Papers, 1992), pp.7-11; Williams with Archibald, ‘Cuerdale Coins’, pp. 39-51.

⁶ E. Hawkins, ‘Coins and Treasure Found in Cuerdale’, 1-104.

⁷ J. Graham-Campbell (ed.), *The Cuerdale Hoard*, British Museum Research Publications, 185 (London: British Museum Press, forthcoming).

Contents

Found in wooden and lead box.

Kingdom	Coin Type	Numbers found	Dates
East Anglia	Aethelred I	2	c.870
	Æthelstan	23	c.825-840
Mercia	Ceolwulf	1	821-23
Anglo-Saxon	Alfred	857	871-99
	Edward the Elder	45	899-924
Southern Danelaw	St Edmund	1770	c.895-c.910
Northern Danelaw	Sitric (Comes)	2	c.895-c.905
	Siefred	304	c.895-c.905
	Ebraice Civitas	486	c.895-c.905
	Quentovic	23	c.895-c.905
	Cunnetti	1860	c.895-c.905
	Mirabilia Fecit	315	c.895-c.905
Canterbury	Ceolnoth	1	833-70
	Plegmund	59	890-914
	Alwaldus	1	899
Carolingian	Louis	34	Late 9th century
	Charles (Bald or Simple)	727	839-923
	Carloman	7	Mid 10th century
	Berengar of Italy	13	898-900
	Odo	197	888-898
	Lambert	11	894-8
Kufic	Unknown	some	
Hacksilver and ornaments	Ornaments, ingots and fragments	c.1000oz	
	TOTAL coins	At least 6738	

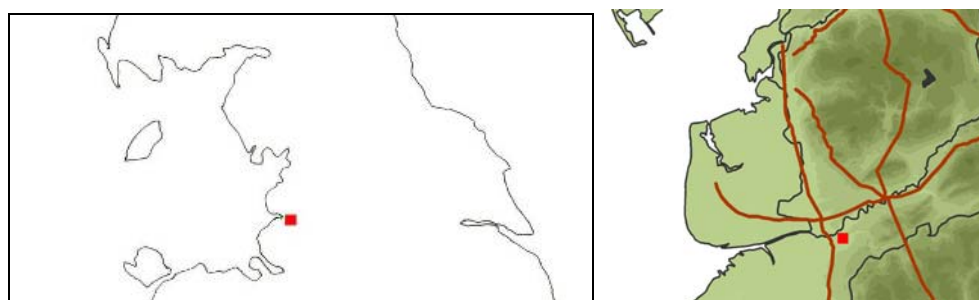


Figure IV.1 The location of Cuerdale and Cuerdale in context showing the site of the hoard (red square), the River Ribble (dark blue) and sites of Roman roads (orange).

Location

The hoard was found about 30ft from the bank of the River Ribble and about 3ft deep in the ground.⁸ Since it was discovered during works to reinforce the embankment of the modern river, it can be assumed that the hoard was originally buried some distance from the tenth-century course of the river, which had changed over the intervening millennium to expose the hoard. The river at this point is not navigable but the hoard was found near a river crossing.⁹ It was also near several Roman roads in the lower Ribble valley which were still in use c.900, and are shown in red Figure IV.1 above.¹⁰

Dispersal

As with many early hoards, the coins were largely dispersed, to workmen and various other parties such as the landowner and Kenyon. The best summary of the reconstruction of the dispersal is in the dedicated Cuerdale volume *Viking Treasure from the North West: The Cuerdale Hoard in Context*.¹¹

Bibliography

Fitzwilliam Museum, *Checklist*, number 87.
Thompson, number 112.

Coins

Archibald, M.M., 'Dating Cuerdale: The Evidence of the Coins', in *Viking Treasure from the North West: The Cuerdale Hoard in its Context* (Liverpool Museum: National Museums and Galleries on Merseyside Occasional Papers, 1992), pp. 15-20.

— 'The Evidence of Pecking on Coins from the Cuerdale Hoard: Summary Version', in *Silver Economy in the Viking Age*, ed. by J. Graham Campbell and G. Williams (Walnut Creek, CA: Left Coast Press, 2007), pp. 49-53.

Blunt, C.E., 'The Composition of the Cuerdale Hoard', *British Numismatic Journal*, 53 (1983), 1-6.

⁸ J. Kenyon, 'Discovery of Ancient Coins and other Treasure near Preston', *Numismatic Chronicle*, 3 (1840/1), 62.

⁹ F.A. Philpott, 'A Silver Saga: Viking Treasure from the North West', in *Viking Treasure from the North West: The Cuerdale Hoard in its Context* (Liverpool Museum: National Museums and Galleries on Merseyside Occasional Papers, 1992), p. 32.

¹⁰ D. Griffiths, 'The Coastal Ports of the Irish Sea', in *Viking Treasure from the North West: The Cuerdale Hoard in its Context* (Liverpool Museum: National Museums and Galleries on Merseyside Occasional Papers, 1992), p. 67.

¹¹ Graham-Campbell, 'Viking and Victorian Treasure', pp. 1-14.

Blunt, C.E., B.H.I.H. Stewart and C.S.S. Lyon, *Coinage in Tenth Century England: From Edward the Elder to Edgar's Reform* (Oxford: Published for the British Academy by Oxford University Press, 1989), pp. 25-6, 33-5.

Dolley, R.H.M., and N. Shiel, 'A Hitherto Unsuspected Oriental Element in the 1840 Cuerdale Hoard', *Numismatic Chronicle*, 142 (1982), 155-6.

Haigh, D.H., 'On the Coins of the Cuerdale Find, with the Names of "Sifredus", "Cunnetti", and "Ebraice"', *Numismatic Chronicle*, 5 (1843), 105-17.

Hawkins, E., 'An Account of the Coins and Treasure found in Cuerdale', *Archaeological Journal*, 4 (1847), 111-30 and 189-99.

— 'An Account of Coins and Treasure Found in Cuerdale', *Numismatic Chronicle*, 5 (1842-3), 1-104.

De Longpérier, A., 'Note on some Coins of the Cuerdale Find', *Numismatic Chronicle*, 5 (1843), 117-20.

Lowick, N.M., 'The Kufic Coins from Cuerdale', *British Numismatic Journal*, 47 (1980), 19-28.

Lyon, C.S.S., and B.H.I.H. Stewart, 'The Northumbrian Viking Coinage in the Cuerdale Hoard,' in *Anglo-Saxon Coins: Studies Presented to F.M. Stenton on the Occasion of his 80th Birthday*, ed. by R.H.M. Dolley (London: Methuen, 1961), pp. 96-121.

Non-Numismatic Content

Edwards, B.J.N., 'Roman Bone Pins from the Cuerdale Hoard', *Antiquaries Journal*, 65 (1984), 365-6.

Kendrick, T.D., 'Bone Pins found with the Cuerdale Treasure', *Antiquaries Journal*, 21 (1941), 162-3.

Lang, J., and G. Graham-Campbell, 'The Scientific Examination of a Fragment of a Silver Bossed Brooch from Cuerdale, Lancashire, England', *Norwegian Archaeological Review*, 9:2 (1976), 127-8.

Lewis, J., 'Silver Ingots from the Cuerdale Hoard in two Northern Collections', *Lancashire Archaeological Journal*, 2 (1982), 47-80.

General

Galster, G., 'Cuerdale-fundet og de danske vikingekonger i det 9. århundrede', *Aarbøger for nordisk oldkyndighed og historie 1962* (1962), 1-36.

Graham-Campbell, J., 'The Northern Hoards: From Cuerdale to Bossall/Flaxton', in *Edward the Elder, 899-924*, ed. by N. Higham and D.H. Hill (London: Routledge, 2001), pp. 212-229.

— ‘The Cuerdale Hoard: Comparisons and Context’, in *Viking Treasure from the North West: The Cuerdale Hoard in its Context* (Liverpool Museum: National Museums and Galleries on Merseyside Occasional Papers, 1992), pp.107-115.

— ‘The Cuerdale Hoard: A Viking and Victorian Treasure’, in *Viking Treasure from the North West: The Cuerdale Hoard in its Context*, ed. by J. Graham Campbell (Liverpool Museum: National Museums and Galleries on Merseyside Occasional Papers, 1992), pp.1-14.

Kenyon, J., ‘Discovery of Ancient Coins and other Treasure near Preston’, *Numismatic Chronicle*, 3 (1840/1), 62-5, 112.

Sugden, K., and M. Warhurst, ‘A Cuerdale Parcel Rediscovered’, *British Numismatic Journal*, 48 (1978), 107-9.

G. Williams, ‘Hoards from the Northern Danelaw from Cuerdale to the Vale of York’, in *Vikings in the North-West*, ed. by J. Graham-Campbell and R. Philpott (Liverpool: National Museums Liverpool, 2009), pp. 73-83.

5. Drogheda

Co. Louth, discovered in June 1846

Deposited c.905

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon, Danish and oriental		2 gallons	
Northern Danelaw	Cunnetti	1 fragment	c.895-c.905
Kufic		3 fragments	
Hacksilver and ornaments	-	-	-
	TOTAL coins	Many hundreds	

Dispersal

Most coins are thought to have been sent to London. Dr Aquila Smith saw the 4 fragments above.

Bibliography

Fitzwilliam Museum, *Checklist*, number 88.

Thompson, number 129.

Crooker, C., ‘Report of a Hoard from Drogheda’, *Journal British Archaeological Association*, 3 (1848), 334.

6. York Walmgate

Yorkshire

Deposited c. 910-15

Discovery

The hoard was discovered in 1856 during digging for a sewer but was dispersed upon discovery without an inquest. It has been said that about a ‘shovelful’ of coins were found by children and others.¹² The few surviving coins associated with this hoard have a very dark patina and tend to have transposed letters and are blundered which makes them a possible provenance for the group of ‘defective’ Swordless St Peter coins in the British Museum, although this group may belong to the eighteenth-century ‘Lancashire’ hoard.¹³

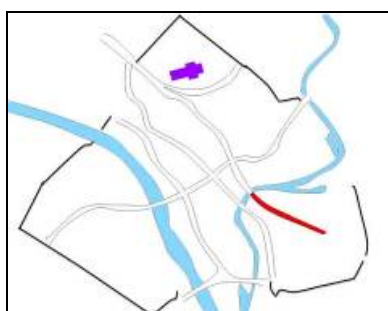


Figure IV.2 The location of Walmgate (in red) in York. The rivers Foss and Ouse are marked in blue, and York Minster in purple.

Location

Walmgate lies beyond the River Foss, in an area known from archaeological excavations to have been developed during the Anglo-Scandinavian period.¹⁴

Contents

Kingdom	Coin Type	Numbers found	Dates
Northern Danelaw	Swordless St Peter	A ‘shovelful’	c.905-c.919
Hacksilver and ornaments	-	-	-
TOTAL coins		A few hundred	

Bibliography

Fitzwilliam Museum, *Checklist*, number 94.

Thompson, number 392.

Chester, G.J., ‘An Account of a Recent Discovery at York’, *Archaeological Journal*, 13 (1856), 283, 392.

¹² G.J. Chester, ‘An Account of a Recent Discovery at York’, *Archaeological Journal*, 13 (1856), 287.

¹³ M. Gooch, ‘Notes on the Swordless St Peter Coinage’, *Numismatic Circular*, 115 (2007), p. 208; B.H.I.H. Stewart and C.S.S. Lyon, ‘Chronology of the St Peter Coinage’, *Yorkshire Numismatist*, 2 (1992), 56.

¹⁴ R.A. Hall, ‘The Topography of Anglo-Scandinavian York’, in *Aspects of Anglo-Scandinavian York*, by R.A. Hall, D.W. Rollason, M. Blackburn et al, The Archaeology of York, 8/4 (London: Council for British Archaeology, 2004), p. 494.

Gooch, M., 'Notes on the Swordless St Peter Coinage', *Numismatic Circular*, 115 (2007), p. 208.

7. 'Lancashire'

Lancashire

Deposited c.915

Discovery

Found before 1734 and presented at the Peterborough Gentlemen's Society.

Contents

Kingdom	Coin Type	Numbers found	Dates
Wessex	Edward the Elder	28	899-924
Hacksilver and ornaments	-	-	-
TOTAL coins		28	

Bibliography

Blunt, C.E., 'Some Doubtful St Peter Hoards', *British Numismatic Journal*, 49 (1979), 14-15.

Blunt, C.E., and B.H.I.H. Stewart, 'The Coinage of Regnald I of York and the Bossall Hoard', *Numismatic Chronicle*, 143 (1983), 146-63.

Stewart, B.H.I.H., and C.S.S. Lyon, 'Chronology of the St Peter Coinage', *Yorkshire Numismatist*, 2 (1992), 56.

8. Dean

Cumbria

Deposited c.915,

Discovery

Nothing is known of the exact location and circumstances of the discovery but is thought to have been discovered before 1780-90. The first report known is a description from the *Gentleman's Magazine* describing coins found in the village of Dean residing in Mr Crosthwaite's small museum in Kewswick.¹⁵ The coins appear to have been sold, possibly to Samuel Tyssen, before his collection was sold to the British Museum in 1870.¹⁶

Location

Dean is a small village located some twelve miles west of Keswick in the Lake District. It lies near the Roman road from Carlisle to Egremont (now A6086), which in turn linked the west coast with the Kingdom of York. It is also situated near to other medieval sites of activity as shown by the presence of Viking-Age crosses at nearby Bridekirk, Gosforth and Irton. Dean was quite likely to have been in an area of intense activity in this period, and quite likely to have been linked with the economic and political sphere of York, perhaps due to its location on the roads linking York and Dublin.

¹⁵ J.S. Strudwick. 'Saxon and Arabic Coins found at Dean, Cumberland', *British Numismatic Journal*, 28 (1955-7), 177.

¹⁶ S. Tyssen, *Leigh & Sotheby's Sale*, 24th October, 1802.

Contents

Found in a lead vessel.

Kingdom	Coin Type	Numbers found	Dates
Wessex	Edward the Elder	2	899-924
Southern Danelaw	St Edmund	3	c.895-c.910
	Alfred Imitation	1	890-900
Northern Danelaw	St Peter	1	c.905-c.919
Carolingian (Italy)	Lambert	1	894-8
Abbasid (750-1517) ¹⁷	Harun al-Rashid	1	786-809
Samanid	Ali al-Muktafi	2	902-8
	Unknown	1	819-1005
	Unknown	19	-
Uncertain	Mark of cross	3	-
Hacksilver and ornaments	-	-	-
TOTAL coins		34	

Bibliography

Fitzwilliam Museum, *Checklist*, number 95.

Strudwick. J.S., 'Saxon and Arabic Coins found at Dean, Cumberland', *British Numismatic Journal*, 28 (1955-7), 177-80.

9. Manningtree

Essex, discovered in 1995

Deposited c.915

Contents

Kingdom	Coin Type	Numbers found	Dates
Southern Danelaw	St Edmund	c.89	c.895-c.910
Northern Danelaw	St Peter	1	c.905-c.919
Hacksilver and ornaments	-	-	-
TOTAL coins		c.89	

Bibliography

Blackburn, M.A.S. Presidential Address 2005, Currency under the Vikings, Part 2: The Two Scandinavian Kingdoms of the Danelaw, c.895-954', *British Numismatic Journal*, 76 (2006), 204-26.

¹⁷ Information on Islamic dates and dynasties is from C.E. Bosworth, *The Islamic Dynasties: A Chronological and Genealogical Handbook* (Edinburgh: Edinburgh University Press, 1967), Abbāsids pp. 6-7, Sāmānids pp. 170-1, Saffārids pp. 172-3.

10. 'Baldwin' Parcel

Findspot unknown, discovered in 1993

Deposited c.915

Contents

Kingdom	Coin Type	Numbers found	Dates
Southern Danelaw	St Edmund	c.89	c.895-c.910
Hacksilver and ornaments	-	-	-
TOTAL coins		c.89	

Bibliography

Blackburn, M.A.S. Presidential Address 2005, Currency under the Vikings, Part 2: The Two Scandinavian Kingdoms of the Danelaw, c. 895-954', *British Numismatic Journal*, 76 (2006), 204-26.

11 . Chester St John's

Cheshire

Deposited c. 920

Discovery

The hoard was discovered on the 4th of March 1862 by workman excavating for an extension to St John's Church. The hoard was found beneath the slabs of the old nave about 16 feet below ground level.

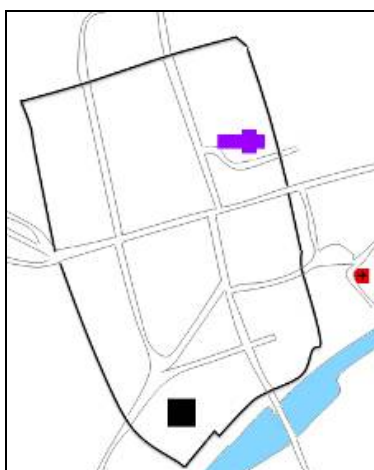


Figure IV.3. The location of St John's (in red) in Chester. The river is shown in blue, the Cathedral in purple and the castle in black.

Location

The site is in the centre of Chester, near the river and next to remains of the Roman amphitheatre. The Dee is navigable at this point and would have given good access to the Irish Sea.

Contents			
Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Edward the Elder	6 (probably c.40)	899-924
Southern Danelaw	St Edmund	1	c.895-c.910
Northern Danelaw	Swordless St Peter	6	c.905-c.919
Uncertain	-	2	-
Hacksilver and ornaments	-	-	-
TOTAL coins		15-55	

Dispersal

It probably contained about 40 coins, but only 20 of these can now be traced as the coins never reached a museum, and many were broken from rough handling or taken as souvenirs.¹⁸ The coins were obscure until a sale in 1966 when Commander R.P. Mack bought the coins and published an article on the hoard attempting to reconstruct the contents.¹⁹

Bibliography

Fitzwilliam Museum, *Checklist*, number 99.
Thompson, number 83.

Mack, R.P., 'St John's Church, Chester, hoard of 1862', *British Numismatic Journal*, 36 (1967), 36-39.

Stewart, B.H.I.H., 'The St Martin Coinage of Lincoln', *British Numismatic Journal*, 36 (1967), 46-54.

Hughes, T., 'On Some Anglo-Saxon Coins discovered in the Foundations of St John's Church, Chester', *Chester Architectural Archaeological and Historical Society Journal* (1855/62 [1864]), 289-308.

12. Geashill

Co. Offaly
Deposited c.920

Contents			
Kingdom	Coin Type	Numbers found	Dates
Northern Danelaw	Rægnald	1	c.919-c.921
	Swordless St Peter (Karolus)	4	c.905-c.919
Hacksilver and ornaments	-	-	-
TOTAL coins		5	

¹⁸ T. Hughes, 'On Some Anglo-Saxon Coins discovered in the Foundations of St John's Church, Chester', *Chester Architectural Archaeological and Historical Society Journal* (1855/62 [1864]), 289.

¹⁹ R.P. Mack, 'St John's Church, Chester, hoard of 1862', *British Numismatic Journal*, 36 (1967), 36.

Dispersal

The coins were presented to the British Museum in 1862, and it is thought that the entire hoard is as recorded.²⁰

Bibliography

Fitzwilliam Museum, *Checklist*, number 105.

Dolley, R.H.M., 'An Unpublished Hoard of 'St Peter' Pence', *Numismatic Chronicle*, 17, 6th ser. (1957), 123-32.

13. Kildare

Co. Kildare, discovered in October 1866.

Deposited c.920

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Edward the Elder	4	899-924
	Æthelstan	2	924-939
Kufic	Unknown	1	-
Hacksilver and ornaments	-	-	-
TOTAL coins		7	

Dispersal

To Dr Aquila Smith in 1840.²¹

Bibliography

Fitzwilliam Museum, *Checklist*, number 114.

Thompson, number 205.

Lindsay, J., *A View of the Coinage of the Heptarchy* (Cork: Messers. Bolster, 1842).

14. Brantham

Suffolk, discovered in 2003

Deposited c.923

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Edward the Elder	90+	899-924
Hacksilver and ornaments	-	-	-
TOTAL coins		90+	

²⁰ R.H.M. Dolley, 'An Unpublished Hoard of 'St Peter' Pence', *Numismatic Chronicle*, 17, 6th ser. (1957), 123.

²¹ J.D.A. Thompson, *Inventory of British Coin Hoards, AD 600-1500* (Oxford: Oxford University Press, 1956), p.76.

Bibliography

Blackburn, M.A.S., 'Presidential Address 2005, Currency under the Vikings, Part 2: The Two Scandinavian Kingdoms of the Danelaw, c. 895-954', *British Numismatic Journal*, 76 (2006), 204-26.

15. Framlingham Earl

Norfolk, discovered in 1994-7.

Deposited c.915

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Edward the Elder	21	899-924
Hacksilver and ornaments	-	-	-
TOTAL coins		21	

Bibliography

Blackburn, M.A.S., 'Presidential Address 2005, Currency under the Vikings, Part 2: The Two Scandinavian Kingdoms of the Danelaw, c. 895-954', *British Numismatic Journal*, 76 (2006), 204-26.

16. Lugga

Co. Meath, discovered c.1843

Deposited c.920-30.

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Edward the Elder	8	899-924
Southern Danelaw	St Edmund	1	c.895-c.910
Samanid	Nasr b. Ahmad II	1	914
Hacksilver and ornaments	-	-	-
TOTAL coins		10	

Dispersal

Purchased for the Museum of the Royal Irish Academy in March 1863.

Bibliography

Thompson, number 263.

Smith, A., 'On Anglo-Saxon Coins found in Ireland', *Numismatic Chronicle*, ns. 3 (1863), 255-7.

17. Bangor

Gwynedd

Deposited c.925

Discovery

Little is known of the discovery of this hoard, though it was reported in the *Illustrated Archaeologist* in 1897 and by the *Cambrian Archaeological Association* and is thought to have been discovered in 1894.²²

Location

Bangor is situated on the mainland opposite the isle of Anglesey in Gwynedd which in medieval times, as in modern is the closest sailing point for Dublin from mainland Britain. There is evidence of early medieval activity on Anglesey but possibly at a later date than this hoard.²³ It is also situated just off the Roman road from Chester to Caernarfon, and in a relatively easily navigable part of north Wales where routes are not too inhibited by mountains along this coastal route.

It is also worth noting that this was also the kingdom of Hywel Dda who succeeded to the Kingdoms of Dyfed in c.904, Seisylllog in c.920 and Gwynedd in 942. He was an ally and perhaps sub-king of Edmund shortly before his death as part of the party pledging loyalty to the Wessex king in Tanshelf in 947, and it is likely he and his predecessors took part in northern politics before this.²⁴

Contents

Kingdom	Coin Type	Numbers found	Dates
Wessex	Edward the Elder	3	899-924
Northern Danelaw	Sihtric Sword	1	921-7
	Anonymous Sword	1	920s
	Sword St Peter	3	c.921-7
	Uncertain imitation	1	902-7
Samanid	Ismail b. Ahmad I	2	892-907 (900-2/3)
	Ahmad b. Ismail II	1	907-914 (909/10)
	Ahmad b. Ismail (imitation)	1	911/12
	Uncertain imitation	1	902-7
Hacksilver and ornaments	Cut ingot and stamped arm ring fragment	2	-
	TOTAL coins	13	

²² C.E. Blunt, 'Saxon Coins from Southampton and Bangor', *British Numismatic Journal*, 27 (1952-54), 259.

²³ M. Redknapp, 'Viking-Age Settlement in Wales and the Evidence from Llanbedrgoch', in *Land, Sea and Home: Proceedings of a Conference on Viking-Period Settlement at Cardiff, July 2001*, ed. by J. Hines, A. Lane and M. Redknapp (Leeds: Maney, 2004), pp. 159-75.

²⁴ ASC, D, s.a. 947.

Bibliography

Fitzwilliam Museum, *Checklist*, number 106.

Thompson, number 32.

Blunt, C.E., 'Saxon Coins from Southampton and Bangor', *British Numismatic Journal* 27 (1952-54), 256-62.

Blunt, C.E., B.H.I.H. Stewart and C.S.S. Lyon, *Coinage in Tenth Century England: From Edward the Elder to Edgar's Reform* (Oxford: Published for the British Academy by Oxford University Press, 1989).

Stewart, B.H.I.H., 'The St Martin Coinage of Lincoln', *British Numismatic Journal*, 36 (1967), 46-54.

Stewart, B.H.I.H., 'The Anonymous Anglo-Viking Issue with Sword and Hammer Types and the Coinage of Sihtric I', *British Numismatic Journal*, 52 (1982), 108-16.

18. Bossall/Flaxton

North Yorkshire

Deposited c.925

Discovery

The hoard was turned up by a plough on a farm occupied by Benjamin Wright and owned by Henry Cholmley on the 14th September 1807. Robert Belt, who had acquired some coins from the hoard, wrote to the *Gentleman's Magazine* and noted that two coins were turned up by an 'ignorant workman'.

Location

The hoard was discovered approximately seven miles from York on the Bossall and Flaxton Parish boundary on the road to Malton (now A64). The hoard was found in an area close to the economic and political sphere of York itself, and in contrast to most of the hoards in this gazetteer, it was discovered east of the Penines, and on a road heading to or from the north east.

Contents

Found in a wooden box, which then broke.

Kingdom	Coin Type	Numbers found	Dates
Wessex	Alfred	1	871-99
	Edward the Elder	5	899-924
	Æthelstan	2	924-39
Southern Danelaw	St Edmund	2	c.895-c.910
Northern Danelaw	Cnut	1	c.895-c.905
	Swordless St Peter	29 (more than 150)	c.905-c.919
	Rægnald	12	c.919-921
Sāmānid	Unknown	2	819-1005 (c.915-c.930)
Hacksilver and ornaments	-	2lb	-
TOTAL coins		55-c.270	

Dispersal

The main beneficiaries of the hoard were the abovementioned Robert Belt, and landowner Henry Cholmley. Cholmley's portion was dispersed with some being sold at a Sotheby's auction,²⁵ while the rest stayed in the family and parcels of Bossall/Flaxton coins are known from ancestors Lord St Oswald,²⁶ and another Cholmley ancestor who passed to the contents to the Yorkshire museum in 1875.²⁷ The hoard has been reconstructed from the various parcels and connected to some modern day collections, although there were undoubtedly more coins than the 270 which can be identified today.²⁸

Bibliography

Fitzwilliam Museum, *Checklist*, number 108.

Thompson, number 162.

Blunt, C.E., and R.H.M. Dolley, 'Coins at Nostell Priory, Yorkshire', *British Numismatic Journal*, 30 (1960), 360-1.

Blunt, C.E., and B.H.I.H. Stewart, 'The Coinage of Regnald I of York and the Bossall Hoard', *Numismatic Chronicle*, 143 (1983), 146-63.

Blunt, C.E., B.H.I.H. Stewart and C.S.S. Lyon, *Coinage in Tenth Century England: From Edward the Elder to Edgar's Reform* (Oxford: Published for the British Academy by Oxford University Press, 1989).

Dolley, R.H.M., 'The Post-Brunanburh Coinage of York: With some Remarks on the Viking Coinages which Preceded the Same', *Nordisk Numismatisk Årsskrift*, 1957-8 (1958), 13-85.

²⁵ *Sotheby's Sale*, 26th July, 1892 (lots 538-40).

²⁶ C.E. Blunt and R.H.M. Dolley, 'Coins at Nostell Priory, Yorkshire', *British Numismatic Journal*, 30 (1960), 360.

²⁷ H.E. Pagan, 'A Halfpenny of St Eadmund Essaying the York Mint Signature', *Numismatic Chronicle*, 135 (1975), 191.

²⁸ Blunt and Stewart, 'Coinage of Regnald', 151.

— ‘A Neglected but Vital Yorkshire Hoard’, *British Numismatic Journal*, 28 (1955), 11-17.

Dolley, R.H.M., and D. Moore, ‘Some Reflections on the English Coinages of Sihtric Caoch, King of Dublin and of York’, *British Numismatic Journal*, 43 (1973), 45-59.

Graham Campbell, J., ‘The Northern Hoards: From Cuerdale to Bossall/Flaxton’, in *Edward the Elder, 899-924*, ed. by N. Higham and D.H. Hill (London: Routledge, 2001), pp. 212-229.

Lindsay, J., *A View of the Coinage of the Heptarchy* (Cork: Messers. Bolster, 1842), p.120.

Pagan, H.E., ‘A Halfpenny of St Eadmund Essaying the York Mint Signature’, *Numismatic Chronicle*, 135 (1975), 191-4.

Stewart, B.H.I.H., ‘The Anonymous Anglo-Viking Issue with Sword and Hammer Types and the Coinage of Sihtric I’, *British Numismatic Journal*, 52 (1982), 108-16.

19. Boxmoor and ‘Derbyshire’

Hertfordshire and Derbyshire

Deposited c.925

Discovery

Little is known of the Boxmoor and Derbyshire hoards. The vague provenances and southern location have led to the conclusion that these hoards are in fact part of other hoards given a false provenance, intentionally or otherwise.

Location

The location of the Boxmoor hoard indeed supports the theory that it may not be a hoard which contained Viking coins of York. Boxmoor is in Hertfordshire and is much farther south than any other hoard. Boxmoor lies near the A1 and so could have been reached from the north, though being further south than the Danelaw it may have contained other coins such as East Anglian Danish rather than York. The vague description of Derbyshire is also of little use for most studies of coins and indeed for this chapter on coin distribution in particular.

Contents

Some St Peter coins and others.

Dispersal

These are two of Blunt’s eponymous ‘doubtful’ St Peter hoards in his 1979 paper.²⁹

There is severe doubt whether the two hoards were not indeed the same collection of coins which had no hoard provenance at all. Blunt concluded that the hoard may have been a parcel from elsewhere and the ‘find’ in Boxmoor and/or Derbyshire was thought to have been a fiction.³⁰ I have followed this conclusion and neither Boxmoor nor ‘Derbyshire’ is included in the discussions in Chapters 4 and 5.

²⁹ C.E. Blunt, ‘Some Doubtful St Peter Hoards’, *British Numismatic Journal*, 49 (1979), 12-16.

³⁰ *Ibid.*, 13-14.

Bibliography

Blunt, C.E., 'Some Doubtful St Peter Hoards', *British Numismatic Journal*, 49 (1979), 12-16.

— 'The Coinage of Æthelstan, King of England 924-939', *British Numismatic Journal*, 42 (1974), 35-158.

Rashleigh, J., 'Remarks on the Coins of the Anglo-Saxon and Danish Kings of Northumberland', *Numismatic Chronicle*, 2nd ser., 9 (1869), 54-105.

20. Dublin County

Co. Dublin, discovered April 1883.

Deposited c.925

Contents

Kingdom	Coin Type	Numbers found	Dates
Wessex	Edward the Elder,	27	899-924
	Æthelstan		924-939
Northern Danelaw	St Peter	2	c.905-c.927
	Imitation Edward	1	c.899-c.924
	Floral		
Hacksilver and ornaments	Ingot	1	-
	Fragments	2	
	TOTAL coins	30	

Bibliography

Fitzwilliam Museum, *Checklist*, number 117.

Thompson, number 133.

Smith, A., 'Saxon Coins found in Ireland', *Numismatic Chronicle*, 3rd ser., 3 (1883), 282-7.

21. Harkirke

Lancashire

Deposited c.925

Discovery

The hoard of Harkirke was found on 8th April 1611, while the ground was being dug for the burial of Catholic recusants banned from burial in the nearby Parish church of Sefton.³¹ The land was the property of Mr William Blundell, who kept a private record of the hoard.³²

Location

The Harkirke was a portion of land near to Little Crosby at the end of Bigg Lane, a presumed ancient pathway linking Little Crosby to the coast and the north of Great Crosby. The coast

³¹ J.G. Milne, 'A Note on the Harkirke Find', *Numismatic Chronicle*, 15 (1935) 292.

³² R.H.M. Dolley, 'A Further Note on the Harkirke Find', *Numismatic Chronicle*, 6th ser., 15 (1955), 190.

itself is largely composed of heavily dunified land, with around a mile of sands and dunes before the sea can be reached.³³ Harkirke sits on the west coast near Liverpool, and was potentially near routes linking Dublin and York.

Contents

Found within a broken pottery container

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Alfred	6	c.880-899
	Edward the Elder	8	899-924
Southern Danelaw	Alfred Imitations (Orsnaforda)	1	c.880-899
	St Edmund	4	c.895-c.910
Northern Danelaw	Cunnetti	1	c.895-c.905
	Swordless St Peter	11	c.905-c.919
Canterbury	Plegmund (Danish imitation?)	1	890-923
Carolingian	Berengar of Italy	1	898-900
	Louis the Child	1	889-911
	Charles the Bald	1	839-923
	or Simple		
Hacksilver and ornaments	-	-	-
TOTAL coins		35	

Dispersal

The coins themselves were sent to Wales for safety during the English Civil War but were never recovered,³⁴ and our main knowledge of the hoard comes from a plate drawn by the landowner Blundell which shows the coins.³⁵

Bibliography

Fitzwilliam Museum, *Checklist*, number 92.

Thompson, number 184.

Blunt, C.E., B.H.I.H. Stewart and C.S.S. Lyon, *Coinage in Tenth Century England: From Edward the Elder to Edgar's Reform* (Oxford: Published for the British Academy by Oxford University Press, 1989).

Churchill, W.S., 'The Harkirke find', *Lancashire and Cheshire Archaeological Society Journal*, 5 (1887 [1888]), 219-30.

Dolley, R.H.M., 'A Further Note on the Harkirke Find', *Numismatic Chronicle*, 6th ser., 15 (1955), 189-93.

Milne, J.G., 'A Note on the Harkirke Find', *Numismatic Chronicle*, 15 (1935), p. 292.

³³ Griffiths, 'Coastal Trading Ports', pp. 63-72.

³⁴ Blunt, Stewart and Lyon, *Coinage in Tenth Century England*, p. 249.

³⁵ Ibid, p. 250.

Nelson, P., 'The St Peter Coins of York', *Numismatic Chronicle* (1949), 116.

Stewart, B.H.I.H., 'The St Martin Coinage of Lincoln', *British Numismatic Journal*, 36 (1967), 46-54.

22. Morley St Peter

Norfolk

Deposited c.925

Discovery

The Morley St Peter hoard is one of the few recently discovered and well-documented finds for coins of this period and is adequately documented in a SCBI volume which I will only summarise here.³⁶ The hoard was uncovered by two workmen in the side of a contractor's trench near Wymondham in Norfolk, in the grounds of Wymondham College on 28th January 1958. The coins were later divided between the British Museum, Norfolk Museum and Wymondham College, with none making their way into the collector's market, unlike all previous hoards. It is believed that every coin was recovered and the hoard has been recorded in its entirety.

Location

Wymondham is located some 10 miles south west of Norwich and on the road to Thetford, which is 20 miles away. Whilst no Roman road is recorded, this route (current A11) forms the shortest route between these two major Saxon towns of the period.

Contents

Found in a Thetford ware cooking pot.

Kingdom	Coin Type	Numbers found	Dates
Mercia	Ceolwulf II	1	874-c.880
Wessex	Alfred	80	871-899
	Edward the Elder	762	899-924
	Æthelstan	1	924-939
Southern Danelaw	Æthelstan II (Guthrum)	3	878-890
	St Edmund	19	c.895-c.910
	Cunnetti	1	c.895-c.905
Northern Danelaw	Swordless St Peter	13	c.905-c.919
	Sword St Peter	2	c.921-924
Islamic	-	-	-
Hacksilver and ornaments	-	-	-
TOTAL coins		872	

³⁶ T.H. McK Clough, *Museums in East Anglia: Morley St Peter Hoard and Anglo-Saxon, Norman, and Angevin Coins, and Later Coins of the Norwich Mint*, Sylloge of Coins of the British Isles, 33 (London: Spink, 1980).

Bibliography

Fitzwilliam Museum, *Checklist*, number 107.

Blunt, C.E., B.H.I.H. Stewart and C.S.S. Lyon, *Coinage in Tenth Century England: From Edward the Elder to Edgar's Reform* (Oxford: Published for the British Academy by Oxford University Press, 1989).

Dolley, R.H.M., 'The Post-Brunanburh Coinage of York: With some Remarks on the Viking Coinages which Preceded the Same', *Nordisk Numismatisk Årsskrift*, 1957-8 (1958), 13-85.

Clarke, R.R., and R.H.M. Dolley, 'The Morley St Peter Hoard', *Antiquity*, 32 (1958), 102-3.

McK Clough, T.H., *Museums in East Anglia: Morley St Peter Hoard and Anglo-Saxon, Norman, and Angevin Coins, and Later Coins of the Norwich Mint*, Sylloge of Coins of the British Isles, 33 (London: Spink, 1980).

Stewart, B.H.I.H., 'The Anonymous Anglo-Viking Issue with Sword and Hammer Types and the Coinage of Sihtric I', *British Numismatic Journal*, 52 (1982), 108-16.

— 'The St Martin Coinage of Lincoln', *British Numismatic Journal*, 36 (1967), 46-54.

23. Penrith (Flusco Pike 2)

Cumbria

Deposited c.925

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Edward the Elder	45	899-924
Southern Danelaw	St Edmund	1	c.895-c.910
Northern Danelaw	Swordless St Peter	2	c.905-c.919
	Sword St Peter	6	c.921-7
	Sihtric Sword	3	c.921-7
Canterbury	Plegmund	1	890-923
Islamic		12	
Uncertain fragments		60 (44 coins)	
Hacksilver and ornaments	Whole and fragmentary objects	33	
	TOTAL coins	c. 120	

Bibliography

Ager, B., and G. Williams, 'Penrith Area, Cumbria: Viking Silver Jewellery and Coin Hoard', in *Treasure Report 2005-2006* (London: DCMS, 2008), 101-2, no. 310.

24. Thurstaston

Leicestershire, discovered between 1992 and 2000.

Deposited c.925

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Edward the Elder	3	
Northern Danelaw	Sihtric	5	
	Sword St Peter	2	
Islamic	Ahmad ibn Ismail	1	907-914
	Nasr ibn Ahmad	1	914-943
Hacksilver and ornaments	-	-	-
TOTAL coins		12	

Bibliography

Fitzwilliam Museum, *Checklist*, number 109a.

Blackburn, M.A.S., 'Presidential Address 2005. Currency under the Vikings, Part 2. The Two Scandinavian Kingdoms of the Danelaw, c. 895-954', *British Numismatic Journal*, 76 (2006), 204-26.

— 'A Viking Hoard from Thurstaston, Leics.: A Preliminary Report', *Numismatic Chronicle*, 161 (2001), 349-52.

25. Goldsborough

North Yorkshire

Deposited c.925-30

Discovery

The hoard was discovered while digging foundations for the churchyard wall at Goldsborough in the Autumn of 1858.

Location

Coastal Yorkshire.

Contents

The coins were found in a broken earthenware pot.

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Alfred	1	871-899
	Edward the Elder	1	899-924
Abbasid	Unknown	11	889-910
Saffarid	Unknown	2	861-1003
Samanid	Unknown	18	895-911
Islamic	Illegible	7	-
Hacksilver and ornaments	Ingots and ornaments	Some	-
	TOTAL coins	40	

Dispersal

The coins were acquired by British Museum, but the provenance of some of the coins has been lost. Recent work has reunited some coins with their Goldsborough provenance, but this was not possible for all coins.³⁷

Bibliography

Fitzwilliam Museum, *Checklist*, number 101.

Thompson, number 175.

Williams, G., 'List of Coins in the Goldsborough Hoard', in *The Cuerdale Hoard*, ed. by J. Graham-Campbell, British Museum Research Publications, 185 (London: British Museum Press, forthcoming), Appendix 5.

Vaux, W.S.W., 'An Account of a Find of Coins in the Parish of Goldborough, Yorkshire, *Numismatic Chronicle*, n.s. 1, 65 (1861), 65-71.

Wilson, D. M., 'An Unpublished Fragment from the Goldsborough Hoard', *Antiquaries Journal*, 37 (1958), 72-3.

26. Vale of York

North Yorkshire

Deposited c.927-8

Discovery

The hoard was discovered by local metal detectorists in 2007 and reported to the local Finds Liaison Officer for the Portable Antiquities Scheme. The exact site has been kept secret to deter illegal metal detecting on the site, but the hoard, originally named the Harrogate hoard was found near a river in the Vale of York near that town.

³⁷ G. Williams, 'List of Coins in the Goldsborough Hoard', in *The Cuerdale Hoard*, ed. by J. Graham-Campbell, British Museum Research Publications, 185 (London: British Museum Press, forthcoming), Appendix 5.

Dispersal

The hoard was acquired jointly by the British Museum and Yorkshire Museums in its entirety.

Contents

Found in silver-gilt Carolingian cup with lead fragments covering the vessel.

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Alfred	51	871-899
	Edward the Elder	340	899-924
	Æthelstan	105	924-939
Northern Danelaw	Sword St Peter	22	c.921-924
	St Martin	1	c.921-924
	Sihtric I	2	c.921-924
	'Rorivacastr'	1	c.921-924
	Æthelstan	1	c.924-c939
	imitation		
Canterbury	Plegmund	8	890-914
Carolingian	Sancta Colonia	1	Mid 10th century
	Gratia Dei Rex	3	Mid 10th century
Samanid	Nasr b. Ahmad I	1	
	Ismail b. Ahmad I	3	892-907
	Ahmad b. Ismail	4	907-13
	Nasr b. Ahmad II	2	914-943
	Nasr b. Ahmad (I or II)	1	914-943
	Caliph Al Mu'tamid	1	844-892
	Uncertain	3	
Hacksilver and ornaments	Silver fragments	57	
	Gold armring	1	
	Silver armrings	4	
	TOTAL	617	

Bibliography

Ager, B., 'A Preliminary Note on the Artefacts from the Vale of York Viking Hoard', in *Studies in Early Medieval Coinage*, II, ed. by T. Abramson (Woodbridge: Boydell & Brewer, 2011), pp. 123-136.

Ager, B., and G. Williams, 'The Vale of York Viking Hoard: Preliminary Catalogue', in *Studies in Early Medieval Coinage, Volume II: New Perspectives*, ed. by T. Abramson (Woodbridge: Boydell & Brewer, 2011), pp. 137-147.

Cooper, A., 'The Harrogate Hoard', *Current Archaeology*, 18/8 (2007), 26-30.

Williams, G., 'Coinage and Monetary Circulation in the Northern Danelaw in the 920s in the Light of the Vale of York Hoard', in *Studies in Early Medieval Coinage*, II, ed. by T. Abramson (Woodbridge: Boydell, 2011), 156-65.

— ‘Hoards from the Northern Danelaw from Cuerdale to the Vale of York’, in *Vikings in the North-West*, ed. by J. Graham-Campbell and R. Philpott (Liverpool: National Museums Liverpool, 2009), pp.73-83.

— ‘The Coins from the Vale of York Viking Hoard: Preliminary Report’, *British Numismatic Journal*, 78 (2008), 227-34.

G. Williams and B. Ager, *The Vale of York Hoard* (London: British Museum Press, 2010).

27. Glasnevin

Co. Dublin, discovered in April 1883.

Deposited c.930

Location

The hoard was found near Dublin but the exact location is unknown.

Contents

Kingdom	Coin Type	Numbers found	Dates
Wessex	Edward the Elder	14	899-914
	Æthelstan	13	924-39
Viking York	Sword St Peter	1	c.921-927
Viking East Anglia	St Edmund	1	c.895-c.910
Hacksilver and ornaments	Silver ingot	1	-
	Silver fragments	2	
	TOTAL coins	29	

Bibliography

Fitzwilliam Museum, *Checklist*, number 110.

Dolley, R.H.M., *The Hiberno-Norse Coins in the British Museum*, Sylloge of Coins of the British Isles, 8 (London: Trustees of the British Museum, 1966).

Lindsay, J., *A View of the Coinage of the Heptarchy* (Cork: Messers. Bolster, 1842).

Smith, A., ‘On Anglo-Saxon Coins found in Ireland’, *Numismatic Chronicle*, New ser. 3 (1863), 255-7.

Stewart, B.H.I.H., ‘The Anonymous Anglo-Viking Issue with Sword and Hammer Types and the Coinage of Sihtric I’, *British Numismatic Journal*, 52 (1982), 108-16.

— ‘The St Martin Coinage of Lincoln’, *British Numismatic Journal*, 36 (1967), 46-54.

28. Oxford Carfax

Oxfordshire

Deposited c.930

Discovery

Discovered on the site of Carfax Church in 1896.

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Edward the Elder	1	899-924
	Æthelstan	3	924-939
Hacksilver	-	-	-
	TOTAL	4	

Dispersal

The hoard is now in the Ashmolean Museum, Oxford but the donor is unknown.

Bibliography

Fitzwilliam Museum, *Checklist*, number 118.

Thompson, number 300.

29. Armagh

Co. Armagh, discovered in June 1831.

Deposited c.930-40

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Æthelstan	1	924-939
Northern Danelaw	Olaf Raven	1	c.939-941
Hacksilver and ornaments	-	-	-
	TOTAL	2	

Dispersal

Although only two pennies are described, there may have been more in the hoard. The location of these coins now is unknown.

Bibliography

Fitzwilliam Museum, *Checklist*, number 149.

Thompson, number 13.

Lindsay, J., *A View of the Coinage of the Heptarchy* (Cork: Messers. Bolster, 1842).

30. Scotby

Cumbria, discovered in June 1855.

Deposited 939-40

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Edward the Elder	7	899-924
	Æthelstan	12	927-39
Hacksilver and ornaments	-	-	-
	TOTAL	19	

Dispersal

Only part of the find was recovered.

Bibliography

Fitzwilliam Museum, *Checklist*, number 115.

Thompson, number 324.

Bateman, T., 'List of a Portion of Anglo-Saxon Pennies', *Journal of the British Archaeological Association*, 12 (1855), pp. 350-1.

Blunt, C.E., 'The Scotby Hoard', *British Numismatic Journal*, 42 (1974), 156-7.

Kruse, S.E., 'The Viking-Age Silver Hoard from Scotby: The Non-Numismatic Element', *Transactions of the Cumberland and Westmoreland Antiquarian and Archaeological Society*, 86 (1986), 79-83.

31. Ballytor (Ballitore)

Co. Kildare, discovered in 1837.

Deposited c.940

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Unknown	Some	
Northern Danelaw	Olaf raven	Some	939-941
	Olaf small cross	Some	940s
	Rægnald, cross-moline	Some	c.943-4
	Rægnald standard	Some	c.943-4
Hacksilver and ornaments	-	-	-
	TOTAL coins	Some, thought to be c.60	

Dispersal

Some coins from Ballytor are thought to have been the owned by the Dean of St Patrick. His collection was sold by Sotheby's in 1842, although no provenance is stated for these lots.³⁸

Bibliography

Fitzwilliam Museum, *Checklist*, number 142.

Thompson, number 29.

Lindsay, J., *A View of the Coinage of Ireland* (Cork: Luke H. Bolster, 1839).

32. Co. Tipperary

Co. Tipperary, discovered in c.1844

Deposited c.940-50

Location

County Tipperary, exact location unknown.

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Edward the Elder	5	899-924
	Æthelstan	9	924-939
	Edmund	4	939-946
Hacksilver and ornaments	-	-	-
TOTAL coins		18	

Bibliography

Fitzwilliam Museum, *Checklist*, number 125.

Thompson, number 356.

Lindsay, J., 'Anglo-Saxon Coins found in Co. Tipperary', *Numismatic Chronicle*, 6 (1843-4), 217.

33. Portree

Isle of Skye, discovered on the 7th January 1891.

Deposited c.950

Bibliography

Thompson, J.D.A., number 312.

Richardson, A.B., 'Notice of a Hoard of Broken Silver Ornaments and Anglo-Saxon and Oriental [Cufic] Coins found in Skye', *Proceedings of the Society of Antiquaries Scotland*, 26 (1891-2), 225-40.

³⁸ Dean of St Patrick (H.R. Dawson) Sale, *Sotheby's*, 30 June 1842 and 11 July 1842, lots 122-6.

Stevenson, R.B.K., 'The Iona Hoard of Anglo-Saxon coins', *Numismatic Chronicle*, 6th ser. 11 (1951), 68-90.

Dispersal

The hoard was acquired by the National Museum of Antiquities of Scotland, Edinburgh.

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Edward the Elder	33	899-924
	Æthelstan	62	924-939
Canterbury	Plegmund	1	890-914
Northern Danelaw	St Peter	1	c.905-c.919
	Anon sword	1	c.920s
Samanid	Unknown	14	819-1005 (892-942)
Abbasid	Unknown	1	750-1517 (889-910)
Hacksilver and ornaments	Ingots and ornaments	3	-
	TOTAL coins	113	

34. Carnforth

Lancashire, discovered in September 1997 by metal detectors.

Deposited c.950

Contents

Kingdom	Coin Type	Numbers found	Dates
Islamic	Ismail b. Ahmad	1	892-907
	Ahmad b. Ismail	2	907-13
Hacksilver and ornaments		-	
	TOTAL coins	3	

Dispersal

Lancaster City Museum

Bibliography

Fitzwilliam Museum, *Checklist*, number 101a.

Bland R., (ed.), *Treasure Annual Report 1998 – 1999* (Department for Culture, Media and Sport: London, 2000), pp. 49-51.

35. Oldcastle

Co. Meath, discovered before 1900

Deposited c.950-5

Contents

More than 12 coins were found, only 12 preserved, and only 9 listed.

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Eadmund	1	939-946
	Eadred	5	946-955
	Eadwig	1	955-959
Northern Danelaw	Olaf Raven	1	940s
	Olaf Flower	1	940s
Hacksilver and ornaments	-	-	-
TOTAL coins		9	

Dispersal

Of the 12 coins, 1 was lost, many were fragmentary, 2 were owned by a local resident who later sold one, and the rest passed into the possession of Mr Crofton Rotherham.³⁹

Bibliography

Fitzwilliam Museum, *Checklist*, number 139.

Thompson, number 298.

Crofton Rotherham, E., 'Find of Tenth Century Coins in Co. Meath', *The Journal of the Proceedings of the Royal Society of Antiquaries of Ireland*, 5th ser., 10 (1900), 253-4.

36. Killyon

Co. Meath, discovered in 1876.

Deposited c.956

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Edward the Elder	7	899-924
	Æthelstan	24	924-939 (post 927)
	Eadmund	22	939-946
	Eadred	22	946-955
Northern Danelaw	Olaf Raven	1	940s
	Olaf Sihtricson	1	940s
	Eric Sword	1	920s
Hacksilver and ornaments	-	-	-
TOTAL coins		78	

Dispersal

The bulk of the coins went to Sir John Evans and the Westminster School. The two Oxford pennies of Æthelstan and Eadmund also belonged to Evans and are now in the Ashmolean. A penny of Eadred from this hoard was sold as part of the Grantley collection 1944.⁴⁰

³⁹ E. Crofton Rotherham, 'Find of Tenth Century Coins in Co. Meath', *The Journal of the Proceedings of the Royal Society of Antiquaries of Ireland*, 5th ser. 10 (1900), 253-4.

⁴⁰ Fifth Baron Grantley, *Glendinning's Sale*, 22nd March, 1944 (lot 1067).

Bibliography

Fitzwilliam Museum, *Checklist*, number 138.

Thompson, number 215.

Evans, J., 'On a Hoard of Coins found in Meath' *Numismatic Chronicle*, 3rd ser., 5 (1885), 128-44.

37. Lough Lynn (Lough Lene)

Co. Westmeath, discovered in May 1843.

Deposited after 959

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Æthelstan	4	924-939
	Eadmund	3	939-946
	Eadred	7	946-955
	Eadwig	4	955-959
	Eadgar	1	959-975
Northern Danelaw	Olaf raven	1	939-40
	Eric sword	1	952-4
Canterbury	Plegmund	1	890-923
Carolingian	Louis (the Debonair?)	1	Late 9 th century
	Charles (the Bald or Carloman?)	1	Mid 10 th century
Hacksilver and ornaments	-	-	-
TOTAL coins		24	

Dispersal

Unknown. Although some of the coins are known to have passed through Lindsay's hands.⁴¹

Bibliography

Fitzwilliam Museum, *Checklist*, number 146.

Thompson, number 260.

Lindsay, J., 'Anglo-Saxon Coins found at Lough Lyn, near Mullingar County, Westmeath', *Numismatic Chronicle*, 6 (1843-4), 216-17.

⁴¹ J. Lindsay, 'Anglo-Saxon Coins found at Lough Lyn, near Mullingar County, Westmeath', *Numismatic Chronicle*, 6 (1843-4), 216.

38. Kintbury

Berkshire, discovered in July 1762

Deposited c.959

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Æthelstan	Some	924-939
	Eadmund	1	939-946
	Eadred	2	946-955
	Eadwig	4	955-959
Hacksilver and ornaments	-	-	-
TOTAL coins		More than 7 (47)	

Dispersal

The British Museum has one coin. There are thought to have been 47 coins in the hoard, although only 7 are listed.

Bibliography

Fitzwilliam Museum, *Checklist*, number 140.

Thompson, number 220.

Petit Andrews, J., 'Exhibited Seven Coins of Anglo-Saxon Kings ... found July 1762 under a skull in the Churchyard of Kintbury, Berks', *Archaeologia*, 8 (1787), 430-1.

39. Ballaqueeny

Isle of Man, Port St Mary

Deposited before 960

Discovery

Discovered in c.1873-4 when a field was levelled for gravel extraction, and was found in conjunction with an old stone cross which has since been lost.⁴²

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Edmund	1	939-46
	Eadred	3	946-55
	Eadwig	3	955-9
Northern Danelaw	Olaf	1	939-41
Carolingian	Charles (the Bald, Simple?)	1	Mid C10th
Hacksilver and ornaments	-	-	-
TOTAL coins		More than 2	

⁴² K.A. Bornholdt Colins, 'Viking-Age Finds from the Isle of Man (unpublished Doctoral thesis, University of Durham, 2003), Appendix VIII, pp.1-2.

Dispersal

Some coins are in the Manx Museum, eight of which were given by Mr Kelly, who retained the French coins himself.

Bibliography

Fitzwilliam Museum, *Checklist*, number 143.

Thompson, number 24.

Bornholdt Collins, K.A., 'Viking-Age Finds from the Isle of Man (unpublished Doctoral thesis, University of Durham, 2003), Appendix VIII, pp. 1-9.

40. Chester Eastgate

Cheshire, discovered on the 5th June 1857.

Deposited c.960

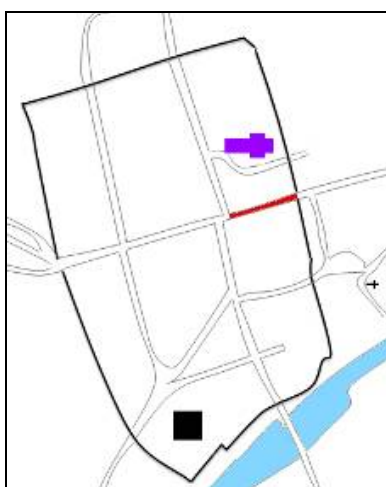


Figure IV.4 The location of the Chester Eastgate hoard (in red).

Location

Eastgate Street lies within the old city walls of Chester, on one of the main thoroughfares through the city.

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Eadred, Eadgar	70-80 (35 listed)	946-975
Hacksilver and ornaments	-	-	-
TOTAL coins		35-80	

Dispersal

It is believed that 70-80 coins were discovered, but about 60 of these were stolen a few days after discovery. Many others were broken or thrown away by finders. There are only descriptions of 35 of the coins found.

Bibliography

Fitzwilliam Museum, *Checklist*, number 153.

Thompson, number 84.

Peacock, J., 'Find of Saxon coins at Chester', *Numismatic Chronicle*, ns., 6 (1866), 322.

41. Islay

Isle of Islay, discovered in November 1852.

Deposited c.960

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Æthelstan	2	924-939
	Eadred	1	946-955
	Edgar	2	959-975
Hacksilver and ornaments	-	-	-
TOTAL coins		5	

Dispersal

Deposited with the National Museum of Antiquaries of Scotland, Edinburgh.

Bibliography

Thompson, number 202.

Scott, W.H., 'Report on a Large Hoard of Anglo-Saxon Pennies, in Silver, Found in the Island of Islay', *Proceedings of the Society of Antiquaries of Scotland*, 1 (1851/4), 74-81.

Stevenson, R.B.K., 'The Iona Hoard of Anglo-Saxon coins', *Numismatic Chronicle*, 6th ser., 11 (1951), 68-90.

42. Keerhan Derry

Co. Antrim, discovered in 1843.

Deposited c.960-70

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Æthelstan	c.100	924-939
Hacksilver and ornaments	-	-	-
TOTAL coins		c.100	

Dispersal

In 1843 parts of the hoard were in the possession of Mr J. Carruthers (63 coins), Mr Edward Benn (20 coins), and Mr K Bell (24 coins), but the current whereabouts are unknown.

Bibliography

Fitzwilliam Museum, *Checklist*, number 164.

Thompson, number 119.

43. Mackrie

Isle of Islay

Deposited c.960-70

Discovery

Found at Mackrie Farm in the parish of Kidalton in 1850.

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Æthelstan	7	924-939
	Eadred	5	946-955
	Eadwig	72	955-959
Northern Danelaw	Olaf	1	940s
	St Peter	1	c.905-c.919
	Uncertain	4	
Kufic		1	
Hacksilver and ornaments	silver 'lumps'	4	-
TOTAL coins		83 + fragments	

Dispersal

The Society of Antiquaries of Scotland acquired 34 coins in 1852. Duplicates were given to the British Museum, the Society of Antiquaries Newcastle and local Scottish museums.

Bibliography

Fitzwilliam Museum, *Checklist*, number 168.

Thompson, number 201.

Scott, W.H., 'Report on a Large Hoard of Anglo-Saxon Pennies, in Silver, Found in the Island of Islay', *Proceedings of the Society of Antiquaries of Scotland*, 1 (1851/4), 74-81.

Stevenson, R.B.K., 'The Iona Hoard of Anglo-Saxon coins', *Numismatic Chronicle*, 6th ser. 11 (1951), 68-90.

44. Smarmore

Co. Louth, discovered in 1929

Deposited c.965

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Edward the Elder	3	899-924
	Æthelstan	1	924-939-
	Eadmund	6	939-946
	Eadred	8	946-955
	Eadwig	9	955-959
	Eadgar	42	959-975
Hacksilver and ornaments	Silver fragments	12	-
TOTAL coins		69	

Dispersal

Acquired by the National Museum of Ireland, Dublin.

Bibliography

Fitzwilliam Museum, *Checklist*, number 147.

Thompson, number 333.

45. Chester Castle Esplanade

Cheshire, discovered on the 29th November 1950

Deposited c.965

Discovery

The hoard was found on 29th November 1950 on the west side of Castle Esplanade whilst workmen were laying electric cabling and was not at first reported to the authorities, a circumstance which may have led to the dispersal of some coins before they were recorded.

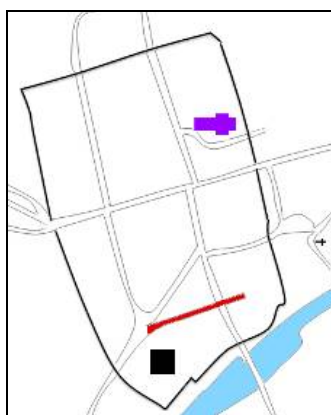


Figure IV.5. The location of the 1950 hoard (in red) in Chester, the Castle is highlighted in black and the Cathedral in purple.

Location

This Chester hoard was found near the river and adjacent to Roman ruins.

Dispersal

Once the find was reported, Graham Webster curator of the Grosvenor Museum, succeeded in collecting the majority of the coins and most of the bullion. The coins were sent to the British Museum for identification and the bulk was returned to the Grosvenor Museum with a representative series retained at the British Museum.

Contents

The coins were found in a pot.

Kingdom	Coin Type	Numbers found	Dates
Wessex	Alfred	1	870-999
	Edward the Elder	7	899-924
	Æthelstan	48	924-939
	Edmund	66	939-946
	Eadred	138	946-955
	Eadwig	112	955-959
	Edgar	139	959-975
Viking York	Olaf Guthfrithson	1	939-41
	Olaf Sihtricson	2	941-44/948-52
Uncertain English	-	3	-
Carolingian	Charles the Bald	2	823-77
	Berengarius I	1	995-24
Hacksilver and ornaments	Jewellery and ingots	Some	
	TOTAL coins	520	

Bibliography

Fitzwilliam Museum, *Checklist*, number 144.

Webster, G., 'A Saxon Treasure Hoard found at Chester', *Antiquaries Journal*, 33 (1953), 22-32.

46. Tetney

Deposited c.970

Discovery

Lincolnshire, discovered in May 1945.

Deposited c.963

Location

Lincolnshire, near the Humber.

Bibliography

Fitzwilliam Museum, *Checklist*, number 141.
Thompson, number 355.

Walker, J., 'A Hoard of Anglo-Saxon Coins from Tetney', *Numismatic Chronicle*, 6th ser., 5 (1945), 81-95.

Dispersal

The coins were sent to the British Museum for examination and some were retained.

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Eadred	47	946-955
	Eadwig	69	955-959
	Eadgar	285	959-975
Northern Danelaw	Eric	1	940s-950s
	Olaf Sihtricson	1	940s
	Uncertain	3	
	imitations		
Hacksilver and ornaments	-	-	-
	TOTAL coins	406	

47. Killincoole

Co. Louth, discovered in June 1864.
Deposited c.970-80

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Æthelstan	1	924-939
	Eadred	3	946-955
	Eadwig	3	955-959
Hacksilver and ornaments	Ingot	1	-
	TOTAL coins	7	

Dispersal

Of the c.40 coins discovered, only seven are preserved in records. Mr Travers Wright, the landowner, retained eight coins. Aquila Smith examined seven coins and exhibited them to the Society of Antiquaries of Ireland in 1864, and published an illustration of the York coin of Eadwig the same year.

Bibliography

Fitzwilliam Museum, *Checklist*, number 154.
Thompson, number 12.

Reade G. H., 'Saxon coins "Discovered in June, 1864" at Allardstown, near Killincoole Castle, co. Louth', *Proceedings and Transactions of the Kilkenny Archaeological Society*, 5 (1864), 375.

48. Douglas

Isle of Man

Deposited c.970

Also known as Ballaquayle or Woodbourne hoard.

Discovery

Discovered on the 12th June 1894 by two workmen digging foundations for a house. Many coins were brittle and fragmented upon discovery, and others were dispersed to the crowd.⁴³

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Æthelstan	7	924-939
	Edmund	7	939-46
	Eadred	40	946-55
	Eadwig	24	955-59
	Edgar	265 + fragments	957-75
Northern Danelaw	Olaf Raven	1	939-41
	Olaf Sihtricson	2	948-52
	Eric Sword	2	952-4
Hacksilver and ornaments	Gold armring	1	-
	Silver armrings	10	
	Fragments	8	
	Ingots	1	
	TOTAL coins	348	

Dispersal

The finder, John Stephen, gave away many coins and many were broken during cleaning. The British Museum retained 19 coins and eight ornaments, the Royal Mint acquired five coins, the finder kept 93 coins and nine ornaments, and the remainder went to the Manx Museum.⁴⁴

Bibliography

Thompson, number 127.

Blunt, C.E., 'A New Parcel from the Douglas, I.O.M., 1894 Hoard (?)', *British Numismatic Journal*, 35 (1966), 7-11.

Bornholdt Colins, K.A., 'Viking-Age Finds from the Isle of Man' (unpublished Doctoral thesis, University of Durham, 2003), Appendix VIII, pp. 23-44.

⁴³ K.A. Bornholdt Colins, 'Viking-Age Finds from the Isle of Man', Appendix VIII, pp. 24.

⁴⁴ Ibid, pp.32.

Dolley, R.H.M., 'New Light on the 1894 Douglas Hoard', *Journal of the Manx Museum*, 7:85 (1969), 121-4.

Grueber, H.A., 'The Douglas [Isle of Man] Find of Anglo-Saxon Coins and Ornaments', *Numismatic Chronicle*, 4th ser., 13 (1913), 322-48.

Kermode, P.M.C., 'Coin Hoard in The Woodbourne treasure Trove, 1894', *Proceedings of the Isle of Man Natural History and Antiquarian Society*, ns., 1 (1913) 437.

Megaw, B.R.S., 'The Douglas Treasure Trove: A Hoard of the Viking Age', *Journal of the Manx Museum*, 4:57 (1938), 77-80 and 82.

Pagan, H.E., 'The 1894 Ballaquayle Hoard: Five Further Parcels of Coins Æthelstan–Eagdar', *British Numismatic Journal*, 50 (1980), 12-19.

Quine, J., 'The Douglas Treasure Trove', *Yn Líoar Mannínagh*, 2 (1901), 242-5.

49. Glendalough

Co. Wicklow, discovered in 1835-6.

Deposited c.975

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Eadmund	Some	939-946,
	Eadred	Some	946-955
	Eadwig	Some	955-959
	Eadgar	4	959-975
Hacksilver and ornaments	-	-	-
TOTAL coins		More than 4	

Dispersal

The majority of coins dispersed. The four coins which were described were probably acquired by Richard Sainthill.

Bibliography

Fitzwilliam Museum, *Checklist*, number 166.

Thompson, number 174.

Lindsay, J., *A View of the Coinage of Ireland* (Cork: Luke H. Bolster, 1839), p. 136

Sainthill, R. 'Notices of Coins, Published in the Gentleman's Magazine 1835 and 1836', *Olla Podrida*, I (London: John Bowyer Nichols and Son, 1844), pp. 105-6

50. Tiree

Isle of Tiree, Hebrides, discovered in 1782

Deposited c.975

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Æthelstan	Some	924-939
	Eadmund	Some	939-946
	Eadred	Some	946-955
	Eadwig	Some	955-959
	Eadgar	Some	959-975
	Edward the Martyr	Some	975-978
Hacksilver and ornaments	-	-	-
	TOTAL coins	Some (15-20oz), more than 90 coins	

Dispersal

The majority went to the National Museum of Scottish Antiquaries, Edinburgh. Bydson & Bailey, jewellers of Glasgow presented 90 coins to the Society of Antiquaries.

Bibliography

Fitzwilliam Museum, *Checklist*, number 171.

Thompson, number 357.

Dolley, R.H.M., 'A Query Concerning the 1782 Find of Anglo-Saxon Coins on Tiree', *Numismatic Circular*, 67 (1959), 159.

Lindsay, J., *A View of the Coinage of Scotland* (Cork, 1845), p. 261.

Stevenson, R.B.K., 'The Iona Hoard of Anglo-Saxon coins', *Numismatic Chronicle*, 6th ser., 11 (1951), opp. p. 80.

51. Iona

Iona, near Mull, close to the Abbey of Iona, discovered on the 11th August 1950.

Deposited c.990

Dispersal

All but a few duplicates and the ornaments went to the National Museum of Antiquities, Edinburgh.

Bibliography

Fitzwilliam Museum, *Checklist*, number 180.

Thompson, number 198.

Stevenson, R.B.K., 'The Iona Hoard of Anglo-Saxon coins', *Numismatic Chronicle*, 6th ser., 11 (1951), p. 68, pl. x-xi.

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Æthelstan	9	924-939
	Eadmund	14	939-946
	Eadred	68	946-955
	Eadwig	26	955-959
	Edgar	191	959-975
	Aethelred II	6	978-1016
Northern Danelaw	Olaf raven	2	939-41
	Olaf flower	2	940s
	Eric	2	940s-950s
	Unidentified copies	3	-
Normandy	Richard II	3	997-1026
	imitations		
Hacksilver and ornaments	Gold and silver ornaments	Some	-
	TOTAL	328	

52. Skail/Sandwick

Orkney, discovered in March 1858

Deposited c. late tenth century.

Contents

Kingdom	Coin Type	Numbers found	Dates
Wessex	Æthelstan	1	924-939
Northern Danelaw	St Peter	1	c.905-920s
Samanid	Ismail Ibn Ahmad I	8	892-907
	Nasr Ibn Ahmad II		914-943
Abbasid	Harun al-Wathiq	1 + fragments	842-847
	Ahmad al-Radi	1 + fragments	934-940
	Abdallah al-Mustakfi	1 + fragments	944-946
Hacksilver and ornaments	-	-	-
	TOTAL coins	13 + fragments	

Dispersal

Acquired by the National Museum of Antiquities, Edinburgh.

Bibliography

Fitzwilliam Museum, *Checklist*, number 129.

Petrie, G., 'List of Treasure Trove, from Orkney and other Places, Presented to the Museum by the Exchequer', *Proceedings of the Society of Antiquaries of Scotland*, 3 (1857/60), 246-7, 249-50.

53. Andreas 1

Isle of Man

Deposited tenth century, c.970

Discovery

Discovered in 1867 during the construction of a new church tower. Tenth and eleventh century carved stones were found in the churchyard.⁴⁵

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Eadred	3	946-55
	Eadwig	3	955-9
	Edgar	17	957-75
	Unknown	2	
Northern Danelaw	Olaf Sihtricson	2	941-4; 948-52
	Eric	1	947-8
Hacksilver and ornaments	-	-	-
TOTAL coins		28	

Dispersal

The Manx Museum, Douglas acquired 18 coins, while others went to private collectors.

Bibliography

Fitzwilliam Museum, *Checklist*, number 155.

Thompson, number 8.

Bornholdt Colins, K.A., 'Viking-Age Finds from the Isle of Man' (unpublished Doctoral thesis, University of Cambridge, 2003), Appendix VIII, pp. 16-22.

Clay, C. C., 'Currency of the Isle of Man from its earliest Appearance to its assimilation with the British coinage in 1840; with the laws and other Circumstances Connected with its History; with Article on Paper Currency, Treasure Trove &c., *Publications of the Manx Society*, 17 (1869).

54. Claremont

Co. Dublin, discovered in March 1838.

Deposited tenth century

Dispersal

Joseph Humphreys was in possession of some coins from the hoard in 1838, and coins with this provenance were sold in the Dean of St Patrick collection.⁴⁶

⁴⁵ Bornholdt Colins, 'Viking-Age Finds from the Isle of Man', Appendix VIII, pp. 17-19.

⁴⁶ Dean of St Patrick (H.R. Dawson) Sale, *Sotheby's*, 30 June 1842 and 11 July 1842 (lots 1211-16).

Bibliography

Thompson, number 89.

Lindsay, J., *A View of the Coinage of the Heptarchy* (Cork: Messers. Bolster, 1842), pp.123-4, pl. 52-55.

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Æthelstan	2	924-939
Northern Danelaw	St Peter	3	c.921-927
	Anon sword	1	c.921-927
Islamic	Unknown	2 or more	-
Danish	Unknown	4 + some more	-
Hacksilver and ornaments	-	-	-
TOTAL coins		12 or more	

55. Mungrett

Co. Limerick, discovered in a stone quarry before 1841

Deposited c.953

Contents

Kingdom	Coin Type	Numbers found	Dates
Anglo-Saxon	Edward the Elder	1	899-924
	Æthelstan	1	924-939
Hacksilver and ornaments	Ingots	Several	
TOTAL coins		2	

Bibliography

Fitzwilliam Museum, *Checklist*, number 135.

Thompson, number 277.

Dolley, R.H.M., 'Some New Light on the Viking Age Silver Hoard from Mungret', *North Munster Antiquarian Journal*, 8 (1960), 116-33.

Lindsay, J., *A View of the Coinage of the Heptarchy* (Cork: Messers. Bolster, 1842), p. 125.

Appendix V: Cross Forms on Anglo-Saxon and Viking Coins

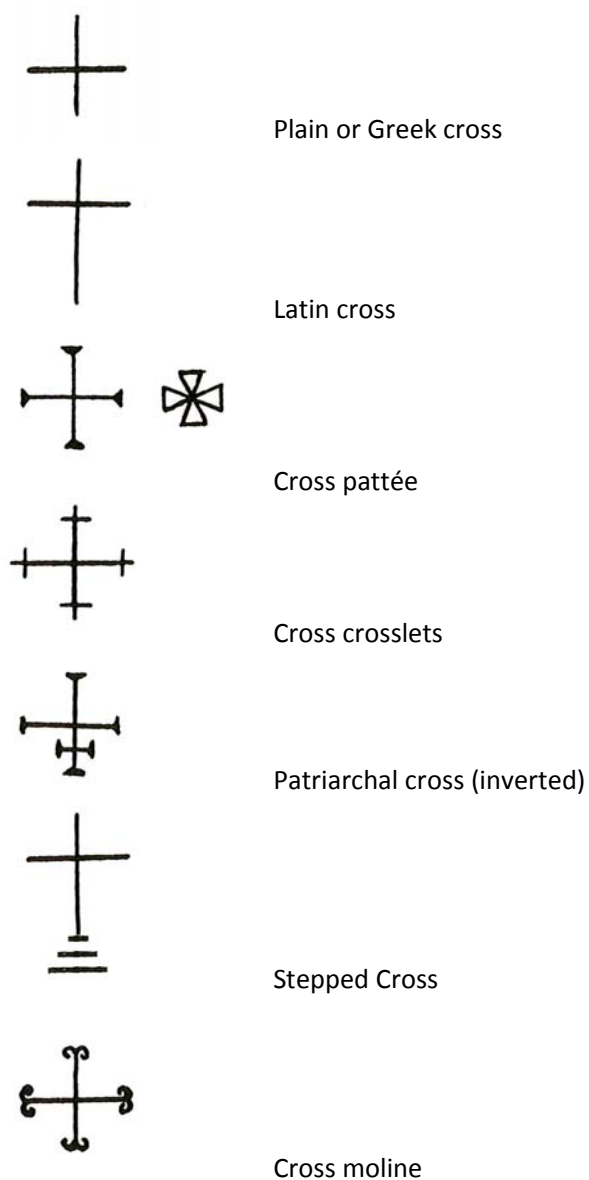


Figure V.1. Cross forms on Anglo-Saxon and Viking coins. From North, *English Hammered Coinage*, p. 253.

Bibliography

Abrams, L., 'The Conversion of the Danelaw', in *Vikings and the Danelaw: Select Papers from the Proceedings of the Thirteenth Viking Congress, Nottingham and York, 21-30 August 1997*, ed. by J. Graham-Campbell (Oxford: Oxbow, 2001), pp. 31-44.

Abramson, T., *Sceattas: An Illustrated Guide; Anglo-Saxon Coins and Icons* (King's Lynn : Heritage Marketing and Publications, 2006).

Ager, B., 'A Preliminary Note on the Artefacts from the Vale of York Viking Hoard', in *Studies in Early Medieval Coinage, II: New Perspectives* ed. by T. Abramson (Woodbridge: Boydell & Brewer, 2011), pp. 121-136.

Ager, B. and G. Williams, *The Vale of York Hoard* (London: The British Museum Press, 2010).

— 'The Vale of York Viking Hoard: Preliminary Catalogue', in *Studies in Early Medieval Coinage, Volume II: New Perspectives*, ed. by T. Abramson (Woodbridge: Boydell & Brewer, 2011), pp. 137-147.

Allen, D., 'Dies in the Public Record Office, 1938', *British Numismatic Journal*, 23 (1938-41), 31-50.

— 'Northumbrian Pennies of the Tenth Century', *British Numismatic Journal*, 22 (1934-7), 175-86.

Allan, H.H., *Sotheby's Sale*, 7th July, 1908.

Allen, M., *Mints and Money in Medieval England* (Cambridge: Cambridge University Press, forthcoming).

— 'The Volume of the English Currency, c.973-1158', in *Coinage and History in the North Sea World, c. AD 500-1200: Essays in Honour of Marion Archibald*, ed. by B.J. Cook and G. Williams (Leiden: Brill, 2006), pp. 487-523.

— 'Medieval English Die-Output', *British Numismatic Journal*, 74 (2004), 39-49.

— 'The Interpretation of Single-Finds of English Coins, 1279-1544', *British Numismatic Journal*, 75 (2005), 50-62.

— 'The Provision and Use of Short Cross Class V Dies', *British Numismatic Journal*, 59 (1989), 46-76.

'Amateur', *Sotheby's Sale*, 6th April, 1899.

M.M. Archibald, 'The Evidence of Pecking on Coins from the Cuerdale Hoard: Summary Version', in *Silver Economy in the Viking Age*, ed. by J. Graham-Campbell and G. Williams (Walnut Creek, CA: Left Coast Press, 2007), pp. 49-53.

- ‘Two Ninth-Century Viking Weights Found near Kingston, Dorset’, *British Numismatic Journal*, 68 (1998), 11-20.
- ‘Dating Cuerdale: The Evidence of the Coins’, in *Viking Treasure from the North West: The Cuerdale Hoard in its Context* (Liverpool Museum: National Museums and Galleries on Merseyside Occasional Papers, 1992), pp. 15-20.
- *British Museum: Anglo-Saxon Coins, Part V, Athelstan to Edgar’s Reform*, Sylloge of Coins of the British Isles, 34 (London: Published for the Trustees of the British Museum by British Museum Publications, 1986).
- ‘A Scandinavian Coin of Carolingian Type from the Cuerdale Hoard’, *Hikuin*, 11 (1985), 79-82.
- ‘Coins and Currency’, in *Viking Artefacts: A Select Catalogue*, ed. by J. Graham-Campbell (London: British Museum Publications, 1980), pp. 102-222.
- ‘English Medieval Coins as Dating Evidence’, in *Coins and the Archaeologist*, ed. by J. Casey and R. Reece, British Archaeological Reports, British Series, 4 (Oxford: British Archaeological Reports, 1974), pp. 234-71.
- Aristotle, *Politics*, trans. by B. Jowett, available at <http://classics.mit.edu/Aristotle/politics.html> [accessed 27 June 2011].
- Arnold, T. (ed.), *Symeonis Monachi Opera Omnia*, 2 vols (London: Longman, 1882-5).
- Aðalbjarnarson, B. (ed.), *Snorri Sturluson: Heimskringla*, 3 (Reykjavik: Hid Islenzka Fornritafélag, 1941).
- ‘Astronomer’, (F. McClean), *Sotheby’s Sale*, 11th June, 1906.
- Backhouse, J., D.H. Turner and L. Webster (eds), *The Golden Age of Anglo-Saxon Art: 966-1066* (London: British Museum Press, 1984).
- Bailey, R.N., ‘Scandinavian Myth on Viking-Period Stone Sculpture in England’, in *Old Norse Myths, Literature, and Society*, ed. by G. Barnes, and M.C. Ross (Sydney: University of Sydney, 2002), pp. 15-23.
- *England’s Earliest Sculptors* (Toronto: University of Toronto, 1996).
- *Viking Age Sculpture in Northern England* (London: Collins, 1980).
- Bank of England, *Sotheby’s Sale*, 13th July, 1877.
- Barker, P.S. (ed.), *The Anglo-Saxon Chronicle: A Collaborative Edition, Volume 8, MS F* (Cambridge: Brewer, 2000).
- Barton, C., and F. Hitchcock (eds), *Treasure Annual Report 2005/6* (London: Department for Culture, Media and Sport, 2008).

Bascom, G.J., *Sotheby's Sale*, 15th June, 1914.

Bately, J.M., *The Anglo-Saxon Chronicle: A Collaborative Edition, Volume 3, MS A* (Cambridge: Brewer, 1986).

Bateman, T., 'List of a Portion of Anglo-Saxon Pennies', *Journal of the British Archaeological Association*, 12 (1855), pp. 350-1.

Bayley, J., *Anglo-Scandinavian Non-Ferrous Metalworking from 16-22 Coppergate*, Archaeology of York. Vol.17, Small finds; fasc. 7 (London: Council for British Archaeology for the York Archaeological Trust, 1992).

Berga, T., *Latvian Collections: Anglo-Saxon and Later British Coins*, Sylloge of Coins of the British Isles, 45 (London: Published for the British Academy by Oxford University Press, 1996).

Bergne, J.B., *Sotheby's Sale*, 20th May, 1873.

Binchy, D.A., *Celtic and Anglo-Saxon Kingship*, (Oxford: Clarendon Press, 1970).

Biringuccio, V., *The Pirotechnia of Vannoccio Biringuccio: The Classic Sixteenth Century Treatise on Metals and Metallurgy*, ed. and trans. by C.S. Smith and M.T. Gnudi (New York: Dover Press, 1959, repr. 1990).

Birley, E., 'The Orton Scar Find, and Thomas Revely of Kendal', *Transactions of the Cumberland and Westmoreland Antiquarian and Archaeological Society*, 2nd ser., 64, (1964), 81-85.

Bischoff, B., *Latin Palaeography: Antiquity and the Middle Ages*, trans. by D. O Croinin and D. Ganz (Cambridge: Cambridge University Press, 1990).

Bjerre Finnestad, R., 'The Study of Christianisation of the Nordic Countries: Some Reflections', in *Old Norse and Finnish Religions and Cultic Place-names: Based on Papers read at the Symposium on Encounters between Religions in Old Nordic Times and on Cultic Place-names held at Åbo, Finland on the 19-21st of August, 1987*, ed. by T. Ahlbäck (Åbo: Donner Institute for Research in Religious and Cultural History, 1990), pp. 256-72.

Blackburn, M.A.S., *Viking Coinage and Currency in the British Isles* (London: British Numismatic Society Special Publications, 2011).

— 'The Viking Winter Camp at Torksey, 872-3', in *Viking Coinage and Currency in the British Isles*, ed. by M.A.S. Blackburn (London: British Numismatic Society Special Publications, 2011), pp. 220-64.

— 'Crosses and Conversion: The Iconography of the Coinage of Viking York ca. 900', in *Cross and Culture in Anglo-Saxon England: Studies in Honour of George Hardin Brown*, ed. by K.L. Jolly, C.E. Karkov and S.L. Keefer (Morgantown: West Virginia University Press, 2008), pp. 172-200.

— 'Presidential Address 2005, Currency under the Vikings, Part 2: The Two Scandinavian Kingdoms of the Danelaw, c. 895-954', *British Numismatic Journal*, 76 (2006), 204-26.

— ‘Presidential Address 2004, Currency under the Vikings, Part 1: Guthrum and the Earliest Danelaw Coinages’, *British Numismatic Journal*, 75 (2005), 18-43.

— ‘The Coinage of Scandinavian York’, in *Aspects of Anglo-Scandinavian York*, by R. A. Hall *et al.* (York: Council for British Archaeology, 2004), pp. 325-49.

— ‘Finds from the Anglo-Scandinavian Site of Torksey’, in *Moneta Mediævalis: Studia numizmatyczne i historyczne ofiarowane Profesorowi Stanisławowi Suchodolskiemu w 65. rocznicę urodzin*, ed. by B. Paskiewicz (Warsaw: Dig, 2002), pp. 89-101.

— ‘Expansion and Control: Aspects of Anglo-Scandinavian Minting South of the Humber’, in *Vikings and the Danelaw: Select Papers from the Proceedings of the Thirteenth Viking Congress, Nottingham and York, 21-30 August 1997*, ed. by J. Graham-Campbell (Oxford: Oxbow Books, 2001), pp. 125-42.

— ‘A Viking Hoard from Thurcaston, Leics.: A Preliminary Report’, *Numismatic Chronicle*, 161 (2001), 349-52.

— ‘Money and Coinage’, in *The New Cambridge Medieval History, c.700-c.900*, II, ed. by R. McKitterick (Cambridge: Cambridge University Press, 1995), pp. 539-59.

— ‘The Earliest Anglo-Viking Coinage of the Southern Danelaw (Late Ninth Century)’, in *Proceedings of the Tenth International Congress of Numismatics*, ed. by I.A. Carradice, P. Attwood *et al.* (London: International Association of Professional Numismatists in association with the UK Numismatic Trust, 1990), pp. 341-8.

— ‘The Ashdon (Essex) Hoard and the Currency of the Southern Danelaw in the late Ninth Century’, *British Numismatic Journal*, 59 (1989), 13-38.

Blackburn, M.A.S., and C.S.S. Lyon, ‘Regional Die-Production in Cnut’s *Quatrefoil* Issue’, in *Anglo-Saxon Monetary History: Essays in Memory of Michael Dolley*, ed. by M.A.S. Blackburn (Leicester: Publisher, 1986), pp. 223-72.

Blair, P. H., ‘Some Observations on the "Historia Regum" attributed to Symeon of Durham’, in *Celt and Saxon: Studies in the Early British Border*, ed. by N.K. Chadwick (Cambridge: Cambridge University Press, 1963), pp. 63-118.

— ‘The Northumbrians and their Southern Frontier’, *Archaeologia Æliana*, 4th ser., 26 (1955), 98-126.

Bland, R. (ed.), *Treasure Annual Report 1998 – 1999* (London: Department for Culture, Media and Sport, 2000), pp. 49-51.

Bland, R. and L. Voden-Decker (eds), *Treasure Annual Report 2001* (London: Department for Culture, Media and Sport, 2003).

— *Treasure Annual Report 2000* (London: Department for Culture, Media and Sport, 2002).

Bliss, T., *Sotheby's Sale*, 22nd March, 1916.

Blunt, C.E., 'The Composition of the Cuerdale Hoard', *British Numismatic Journal*, 53 (1983), 1-6.

— 'Some Doubtful St Peter Hoards', *British Numismatic Journal*, 49 (1979), 12-16.

— 'The Coinage of Athelstan, 924-939: A Survey', *British Numismatic Journal*, 42 (1974), 35-156.

— 'The Scotby Hoard', *British Numismatic Journal*, 42 (1974), 156-7.

— 'A New Parcel from the Douglas, I.O.M., 1894 Hoard (?)', *British Numismatic Journal*, 35 (1966), 7-11.

— 'Saxon Coins from Southampton and Bangor', *British Numismatic Journal*, 27 (1952-54), 256-62.

Blunt, C.E. and R.H.M. Dolley, *Reading University: Anglo-Saxon and Norman Coins*, Sylloge of Coins of the British Isles, 11 (London: Published for the British Academy and Kungl. Vitterherts Histoire Och Antikvitets Akademien, 1969).

— 'Coins at Nostell Priory, Yorkshire', *British Numismatic Journal*, 30 (1960), 360-1.

Blunt, C.E., F. Elmore Jones and R.P. Mack, *Norweb Collection: Ancient British and English Coins to 1180*, Sylloge of Coins of the British Isles, 16 (London: Spink, 1971)

Blunt, C.E. and H.E. Pagan, 'Three Tenth-Century Hoards: Bath (1755), Kintbury (1761), Threadneedle Street (before 1924)', *British Numismatic Journal*, 45 (1975), 19-32.

Blunt, C.E. and B.H.I.H. Stewart, 'The Coinage of Regnald I of York and the Bossall Hoard', *Numismatic Chronicle*, 143 (1983), 146-63.

Blunt, C.E., B.H.I.H. Stewart and C.S.S. Lyon, *Coinage in Tenth-Century England: From Edward the Elder to Edgar's Reform* (Oxford: Published for the British Academy by Oxford University Press, 1989).

Bollandus, J. (ed.), *Acta Sanctorum, Martii, I* (Antwerp, Brussels, Tongerlo and Paris, 1668), pp. 469-81.

Booth, J., *Northern Museums: Ancient British, Anglo-Saxon, Norman and Plantagenet Coins to 1279*, Sylloge of Coins of the British Isles, 48 (London: British Academy by Oxford University Press, 1997).

Bornholdt Collins, K., 'The Dunmore Cave [2] Hoard and the Role of Coins in the Tenth-Century Hiberno-Scandinavian Economy', in *The Viking Age: Ireland and the West, Proceedings of the Fifteenth Viking Congress*, ed. by J. Sheehan and D. Ó Corráin (Dublin: Four Courts Press, 2010), pp. 19-46.

— 'Viking-Age Finds from the Isle of Man' (Unpublished Doctoral Thesis, University of Cambridge, 2003).

— ‘Myth or Mint? The Evidence for a Viking-Age Coinage in the Isle of Man’, in *Recent Archaeological Research on the Isle of Man*, British Archaeological Reports, British Series, 278, ed. by P. Davey (Oxford: BAR, 1999), pp. 199-220.

Bosworth, C.E., *The Islamic Dynasties: A Chronological and Genealogical Handbook* (Edinburgh: Edinburgh University Press, 1967).

Boyne, W., *Sotheby's Sale*, 29th June, 1896.

Bracey, R., ‘The Coinage of Wima Kadphises’, in *Gandhāran Studies, III*, ed. by M. Nasim Khan (Peshawar: Ancient and Medieval Gandhāra Research Group, 2009), pp. 25-74.

— *Die Studies*, (Unpublished Educational Leaflet: Department of Coins and Medals, British Museum, 2008).

Brady, J.D., *American Collections: Ancient British, Anglo-Saxon and Norman Coins*, Sylloge of Coins of the British Isles, 30 (London: Published for the British Academy by the Oxford University Press and Spink, 1982).

Briggs, A., *Sotheby's Sale*, 22nd March, 1983.

Brookes, Cannon T., *Sotheby's Sale*, 28nd July, 1947.

Brooks, N.P. and J.A. Graham-Campbell, ‘Reflections on the Viking-Age Silver Hoard from Croydon, Surrey’, in *Anglo-Saxon Monetary History: Essays in Memory of Michael Dolley*, ed. by M. Blackburn (Leicester: Leicester University Press, 1986), pp. 91-110.

— ‘Reflections on the Viking-Age Silver Hoard from Croydon, Surrey’, in *Communities and Warfare, 700-1400*, ed. by N. Brooks (London: Publisher, 2001), 69-92.

Booth, J., ‘Sceattas in Northumbria’, in *Sceattas in England and on the Continent: The Seventh Oxford Symposium on Coinage and Monetary History*, ed. by D. Hill and D.M. Metcalf, British Archaeological Reports, British Series, 128 (Oxford: BAR, 1984), pp. 71-112.

Brown, G.B., *The Ruthwell and Bewcastle Crosses, the Gospels of Lindisfarne, and other Christian Monuments of Northumbria* (London: John Murray, 1921).

Bugge, A., ‘The Golden Vanes of Viking Ships’, *Acta Archaeologica*, 2 (1931), 159-84.

Butler, V.J., ‘The Metrology of the Late Anglo-Saxon Penny: The Reign of Aethelred II and Cnut’, in *Anglo-Saxon Coins: Studies Presented to F.M. Stenton on the Occasion of his 80th Birthday*, ed. by R.H.M. Dolley (London: Methuen, 1961), pp. 195-214.

Buttrey, T.V. ‘Calculating Ancient Coin Production: Facts and Fantasies’, *Numismatic Chronicle*, 153 (1993), 335-51.

Buttrey, T.V. with D. Cooper, ‘Calculating Ancient Coin Production II: Why it Cannot be Done’, *Numismatic Chronicle*, 154 (1994), 341-52.

Camden, W., *Britannia: Translated and Enlarged by the Latest Discoveries by Richard Gough*, Facsimile edn (Hildenheim, NY: Georg Olms Verlag, 1974), I (1806).

Campbell, A. and S. Keynes, *Encomium Emmae Reginae*, Camden Classic Reprints, 4 (Cambridge: Cambridge University Press for the Royal Historical Society, 1998).

— *The Chronicle of Æthelweard*, (London: Thomas Nelson & Sons, 1962).

— ‘The Northumbrian Kingdom of Regnald’, *English Historical Review*, 57 (1942), 85-91.

— ‘Two Notes on the Norse Kingdoms in Northumbria’, *English Historical Review*, 57 (1942), 85-97.

Campbell, J., ‘Observations on English Government from the Tenth to the Twelfth Centuries’, *Transactions of the Royal Historical Society*, 5th ser., 25 (1975), 39-54.

Carlyon-Britton, P.W.P., *Sotheby's Sales*, 17th November, 1913; 20th November, 1916; 11th November, 1918.

Carter, G.F., ‘New Methods for Calculating the Original Number of Dies in a Given Series’, *Numismatic Circular*, 115 (June, 2007), 151-153.

— ‘A Simplified Method for Calculating the Original Number of Dies from Die Link Statistics’, *American Numismatic Society, Museum Notes* (1983), 195-206.

— ‘Comparison of Methods for Calculating the Total Number of Dies from Die-Link Statistics’, in *PACT 5: Statistics and Numismatics: Papers from a Round Table of the Centre de Mathématique Sociale de l'École des Hautes Études en Sciences Sociales de Paris, 17-19 September 1979*, ed. by C. Carcassonne and T. Hackens (Paris: Council of Europe, 1981), pp. 204-213.

Cassidy, B. (ed.), *The Ruthwell Cross* (Princeton: Index of Christian Art, Department of Art and Archaeology, Princeton University, 1992).

Challis, C.E. (ed.), *A New History of the Royal Mint* (Cambridge: Cambridge University Press, 1992).

— ‘Lord Hastings to the Great Silver Recoinage, 1464-1699’, in *A New History of the Royal Mint*, ed. by C.E. Challis (Cambridge: Cambridge University Press, 1992).

— *The Tudor Coinage* (Manchester: Manchester University Press, 1978).

Chaney, W.A., *The Cult of Kingship in Anglo-Saxon England: The Transition from Paganism to Christianity* (Manchester: Manchester University Press, 1970).

Chester, G.J., ‘An Account of a Recent Discovery at York’, *Archaeological Journal*, 13 (1856), 283.

Churchill, W.S., ‘The Harkirke find’, *Lancashire and Cheshire Archaeological Society Journal*, 5 (1887 [1888]), 219-30.

Clark, H., *Sotheby's Sale*, 23rd May, 1898.

- Clarke, R.R. and R.H.M. Dolley, 'The Morley St Peter Hoard', *Antiquity*, 32 (1958), 102-3.
- Clay, C. C., 'Currency of the Isle of Man from its Earliest Appearance to its Assimilation with the British Coinage in 1840; with the Laws and Other Circumstances Connected with its History; with Article on Paper Currency, Treasure Trove &c.', *Publications of the Manx Society*, 17 (1869).
- CNG, *Triton XII Sale*, 6-7 January 2009.
- Collins, R., *Early Medieval Spain: Unity in Diversity, 400-1000* (Basingstoke: Macmillan, 1995).
- Collingwood, W.G., 'The Vikings in Lakeland: Their Place-Names, Remains, History', *Saga-Book of the Viking Society*, 23 (1990-93), 348-62.
- Cook, B.J., 'Crimes Against the Currency in Twelfth- and Thirteenth-Century England', *Bulletin of the John Rylands Library of Manchester*, 83 (2001), 51-70.
- Cooper, A., 'The Harrogate Hoard', *Current Archaeology*, 18/8 (2007), 26-30.
- Cooper, D.R., *The Art and Craft of Coinmaking: A History of Minting Technology* (London: Spink, 1988).
- Coupland, S., 'Money and Coinage under Louis the Pious', in *Carolingian Coinage and the Vikings: Studies on Power and Trade in the Ninth Century* (Aldershot: Ashgate, 2007), pp. 23-54.
- 'From Poachers to Gamekeepers: Scandinavian Warlords and Carolingian Kings', *Early Medieval Europe*, 7:1 (1998), 85-114.
- 'The Vikings in Francia and Anglo-Saxon England to 911', in *New Cambridge Medieval History, c.700-c.900*, II, ed. by R. McKitterick (Cambridge: Cambridge University Press, 1995), pp. 190-201.
- Craig, J., *The Mint: A History of the London Mint from A.D. 287 to 1948* (Cambridge: Cambridge University Press, 1953).
- Cramp, R., *Corpus of Anglo-Saxon Sculpture 2: Cumberland, Westmorland and Lancashire North-of-the-Sands* (Oxford: Published for the British Academy by the Oxford University Press, 1988).
- *Grammar of Anglo-Saxon Ornament: A General Introduction to the Corpus of Anglo-Saxon Stone Sculpture* (Oxford: Published for the British Academy by the Oxford University Press, 1984).
- *Corpus of Anglo-Saxon Stone Sculpture, 1: County Durham and Northumberland* (Oxford: Published for the British Academy by the Oxford University Press, 1984).
- 'The "Viking Type" Penannular Brooch and Torc from Orton Scar', *Transactions of the Cumberland and Westmoreland Antiquarian and Archaeological Society*, 2nd ser., 64 (1964), 86-9.
- Cribb, J., *Money: From Cowrie Shells to Credit Cards* (London: British Museum Press, 1986).
- Crofton Rotherham, E., 'Find of Tenth Century Coins in Co. Meath', *The Journal of the Proceedings of the Royal Society of Antiquaries of Ireland*, 5th ser., 10 (1900), 253-4.

Crooker, C., 'Report of a Hoard from Drogheda', *Journal of the British Archaeological Association*, 3 (1848), 334.

Cubbin, G.P. (ed.), *The Anglo-Saxon Chronicle: A Collaborative Edition*, Vol. 6, *MS D* (Cambridge: Brewer, 1996).

Cuff, J.D., *Sotheby's Sale*, 8th June, 1854.

Cureton, H.O., *Sotheby's Sale*, 10th January, 1859.

Darlington, R.R. and P. McGurk (eds), *The Chronicle of John of Worcester, II: The Annals from 450 to 1066*, trans. by J. Bray and P. McGurk (Oxford: Clarendon, 1995).

Davidson, H.E., *The Lost Beliefs of Northern Europe* (London: Routledge, 1993).

— *Myths and Symbols in Pagan Europe: Early Scandinavian and Celtic Religions* (Manchester: Manchester University Press, 1988).

— *Scandinavian Mythology* (London: Hamlyn, 1969).

Davies, W., and P. Fouracre (eds), *The Languages of Gift in the Early Middle Ages* (Cambridge: Cambridge University Press, 2010).

De Bles, A., *How to Distinguish the Saints in Art: By their Costumes, Symbols and Attributes* (New York: Art Culture Publications, 1975).

De Callatay, F., 'Calculating Ancient Coin Production: Seeing a Balance', *Numismatic Chronicle*, 155 (1995), 289-311.

C. De Hamel, *A History of Illuminated Manuscripts*, 2nd edn. (London: Phaidon, 1994).

De Jong, M., 'Carolingian Monasticism: The Power of Prayer', in *The New Cambridge Medieval History, Vol. II, c.700-c.900*, ed. by R. McKitterick (Cambridge: Cambridge University Press, 1995), pp. 622-53.

De Longpérier, A., 'Note on some Coins of the Cuerdale Find', *Numismatic Chronicle*, 5 (1843), 117-20.

De Simson, D. (ed.), *Annales Xantenses et Annales Vedastini* (Hannover: Impensis, Bibliopolii Hahniani, 1909)

De Waal Malefijt, A., *Religion and Culture: An Introduction to Anthropology of Religion* (New York: Macmillan, 1968).

Dean of St Patrick, (H.R. Dawson), *Sotheby's Sale*, 30th June, 1842; 11th July, 1842.

Department of Culture, Media and Sport, *The Treasure Act 1996: Code of Practice*, 2nd Revision, available at [http://finds.org.uk/documents/treasure_act.pdf] accessed on 3 September 2011.

Devonshire, Duke of, *Christie's Sale*, 26th March, 1844.

- Dodgson, J. McN., 'The Background of Brunanburh', *Saga-Book of the Viking Society*, 14 (1957), 303-16.
- Dodwell, C.R., *The Pictorial Arts of the West, 800-1200* (Newhaven and London: Yale University Press, 1993).
- Dolley, R.H.M., 'Dateringen of de seneste St Peters-monter fra York', *Nordisk Numismatisk Unions Medlemsblad*, 5 (1982), 82-90.
- 'The Anglo-Danish and Anglo-Norse Coinages of York', in *Viking Age York and the North*, ed. by R.A. Hall (London: CBA Research Report, 1978), 26-31.
- 'New Light on the 1894 Douglas Hoard', *Journal of the Manx Museum*, 7:85 (1969), 121-4.
- *The Hiberno-Norse Coins in the British Museum*, Sylloge of Coins of the British Isles, 8 (London: Trustees of the British Museum, 1966).
- *Viking Coins of the Danelaw and of Dublin* (London: Trustees of the British Museum, 1965).
- 'Some New Light on the Viking Age Silver Hoard from Mungret', *North Munster Antiquarian Journal*, 8 (1960), 116-33.
- 'A Query Concerning the 1782 Find of Anglo-Saxon Coins on Tiree', *Numismatic Circular*, 67 (1959), 159.
- 'The Post-Brunanburh Coinage of York: With some Remarks on the Viking Coinages which Preceded the Same', *Nordisk Numismatisk Årsskrift*, 1957-8 (1958), 13-85.
- 'A Note on the So-Called "Raven" Pence of Anlaf Guthfrithsson', *Numismatic Circular*, 65:5 (1957), 189-94.
- 'An Unpublished Hoard of "St Peter" Pence', *Numismatic Chronicle*, 6th ser., 17 (1957), 123-32.
- 'A Further Note on the Harkirke Find', *Numismatic Chronicle*, 6th ser., 15 (1955), 189-93.
- 'A Neglected but Vital Yorkshire Hoard', *British Numismatic Journal*, 28 (1955), 11-17.
- Dolley, R.H.M., and C.E. Blunt, 'The Chronology of the Coins of Ælfred the Great', in *Anglo-Saxon Coins: Studies Presented to F.M. Stenton on the Occasion of his 80th Birthday*, ed. by R.H.M. Dolley (London: Methuen, 1961), pp. 77-95.
- Dolley, R.H.M., and J. Ingold, 'Viking Age Coin-Hoards from Ireland and their Relevance to Anglo-Saxon Studies', in *Anglo-Saxon Coins: Studies Presented to F.M. Stenton on the Occasion of his 80th Birthday*, ed. by R.H.M. Dolley (London: Methuen, 1961), pp. 241-65.
- Dolley, R.H.M., and D.M. Metcalf, 'The Reform of the English Coinage under Edgar', in *Anglo-Saxon Coins: Studies Presented to F.M. Stenton on the Occasion of his 80th Birthday*, ed. by R.H.M. Dolley (London: Methuen, 1961), pp. 136-68.

Dolley, R.H.M., and D. Moore, 'Some Reflections on the English Coinages of Sihtric Caech, King of Dublin and of York', *British Numismatic Journal*, 43 (1973), 45-59.

Dolley, R.H.M., and W. Seaby, *Ulster Museum, Belfast: Part I, Anglo-Irish Coins, John – Edward III*, Sylloge of Coins of the British Isles, 10 (Oxford: Oxford University Press, 1968).

Dolley, R.H.M., and N. Shiel, 'A Hitherto Unsuspected Oriental Element in the 1840 Cuerdale Hoard', *Numismatic Chronicle*, 142 (1982), 155-6.

Downham, C., *Viking Kings of Britain and Ireland: The Dynasty of Ívarr to AD 1044* (Edinburgh: Dunedin, 2007).

— 'Eric Bloodaxe - Axed? The Mystery of the Last Viking King of York', *Mediaeval Scandinavia*, 1 (2004), 51-77.

Drabble, G.C., *Sotheby's Sale*, 4th July, 1939; 13th July, 1943.

Duart-Smith, F.W., *Glendinning's Sale*, 27th November, 1945.

DuBois, T.A., *Nordic Religions in the Viking Age* (Philadelphia: University of Pennsylvania Press, 1999).

Durham University, *The Corpus of Anglo-Saxon Stone Sculpture*, available at <http://www.dur.ac.uk/sculpturecorpus/> [accessed on 15 August 2011].

Durrant, Lieut.-Col. W., *Sotheby's Sale*, 19th June, 1847.

Dyer, G. P., *The Royal Mint: An Illustrated History* (Cardiff: Royal Mint, 1986).

Dymock, Revd. T.F., *Sotheby's Sale*, 1st June, 1858.

Eagleton, C., and J. Williams (eds), *Money: A History*, rev. edn (London: British Museum Press, 2007).

Edmonds, F., 'History and Names', in *The Huxley Viking Hoard: Scandinavian Settlement in the North West*, ed. by J. Graham-Campbell and R. Philpott (Liverpool: National Museums Liverpool, 2009), pp. 2-12.

Edwards, B.J.N., *Vikings in North West England: The Artifacts* (Lancaster: Centre for North-West Regional Studies, 1998).

— 'The Vikings in North-West England: the Archaeological Evidence', in *Viking Treasure from the North West: The Cuerdale Hoard in its Context* (Liverpool Museum: National Museums and Galleries on Merseyside Occasional Papers, 1992), pp. 43-62.

— 'Roman Bone Pins from the Cuerdale Hoard', *Antiquaries Journal*, 65 (1984), 365-6.

Ellis, Sir H., *Sotheby's Sale*, 26th May, 1869.

Elmore-Jones, F., *Glendinning's Sale*, 12th May, 1971.

Ercker, L., *Lazarus Ercker's Treatise on Ores and Assaying*, ed. and trans. by A.G. Sisco and C.S. Smith (Chicago: University of Chicago Press, 1951).

Esty, W.W., 'The Geometric Model for Estimating the Number of Dies', in *Quantifying Monetary Supplies in Greco-Roman Times*, ed. by F. De Callatay (Bari: Edipuglia, 2011), pp. 43-58.

— 'How to Estimate the Original Number of Dies and the Coverage of a Sample', *Numismatic Chronicle*, 166 (2006), 359-64.

— 'Percentile Plots and other Methods of Graphing Coin Weights', *Numismatic Chronicle*, 149 (1989), 135-147.

— 'Estimation of the Size of a Coinage: A Survey and Comparison of Methods', *Numismatic Chronicle*, 146 (1986), 185-215.

Fellows-Jensen, G., 'Scandinavian Place-Names of the Irish Sea Province', in *Viking Treasure from the North West: The Cuerdale Hoard in its Context* (Liverpool Museum: National Museums and Galleries on Merseyside Occasional Papers, 1992), pp. 31-42.

Fewster, C.E., *Sotheby's Sale*, 7th February, 1898.

Fitzwilliam Museum, *Corpus of Early Medieval Coin Finds*, available at http://www.fitzmuseum.cam.ac.uk/dept/coins/emc/emc_search.php [accessed on 14 January 2011].

— *Checklist of Coin Hoards*, available at <http://www.fitzmuseum.cam.ac.uk/dept/coins/projects/hoards/> [accessed on 14 January 2011].

Fletcher, M., and G.R. Lock, *Digging Numbers: Elementary Statistics for Archaeologists* (Oxford: Oxford University Committee for Archaeology, 1991).

Foot, S., *Æthelstan: The First King of England* (New Haven: Yale University Press, 2011).

Fried, J., 'The Frankish Kingdoms, 817-911: The East and Middle Kingdoms', in *The New Cambridge Medieval History, c. 700-c. 900, II*, ed. by R. McKitterick (Cambridge: Cambridge University Press, 1995), pp. 142-69.

Gaimster, M., 'Viking Economies: Evidence from the Silver Hoards', in *Silver Economy in the Viking Age*, ed. by J. Graham-Campbell and G. Williams (Walnut Creek (CA): Left Coast Press, 2007), pp. 123-34.

— 'Money and Media in Viking Age Scandinavia', in *Social Approaches to Viking Studies*, ed. by R. Samson (Glasgow: Cruithne Press, 1991), pp. 113-122.

Galster, G., *Royal Collection, Copenhagen. Part I, Ancient British and Anglo-Saxon Coins*, Sylloge of Coins of the British Isles, 4 (London: Published for the British Academy by the Oxford University Press and Spink, 1964).

— 'Cuerdale-fundetog de danske vikinge kongeridet 9.århundrede', *Aarbøger for nordisk old kyndig hedog historie* 1962, (1962), 1-36.

— 'Karolingiske Mønter Funde I Danmark', *Nordisk Numismatisk Årsskrift* (1951), 28-40.

Gannon, A., 'A Chip off the Rood: The Cross on Anglo-Saxon Coinage', in *Cross and Culture in Anglo-Saxon England: Studies in Honour of George Hardin Brown*, ed. by K.L. Jolly, C.E. Karkov and S.L. Keefer (Morgantown: West Virginia University Press, 2008), pp. 153-71.

— *Iconography of Early Anglo-Saxon Coinage: Sixth to Eighth Centuries* (Oxford: Oxford University Press, 2003).

— 'The Iconography of Anglo-Saxon Coinage (Sixth to Eight Cenuries) (unpublished doctoral thesis, University of Cambridge, 2000).

Gannon, A., L. Voden-Decker, and R. Bland (eds), *Treasure Annual Report 2003* (London: Department for Culture, Media and Sport, 2004).

— *Treasure Annual Report 2002* (London: Department for Culture, Media and Sport, 2004).

Ganshof, F.L., *Frankish Institutions under Charlemagne* (Providence, RI: Brown University Press, 1968).

Garipzanov, I.H., 'Metamorphoses of the Early Medieval Signum of a Ruler in the Carolingian World', *Medieval Europe*, 14:4 (2006), 419-64.

— 'The Image of Authority in Carolingian Coinage: The Image of a Ruler and Roman Imperial tradition', *Early Medieval Europe*, 8:2 (1999), 197-218.

Garmonsway, G.N., and J. Simpson, *Beowulf and its Analogues* (London: Dent, 1968).

Geertz, C., 'Religion as a Cultural System', in *Reader in Comparative Religion: An Anthropological Approach*, ed. by W.A. Lessa and E.Z. Vogt, 2nd edn (New York: Harper and Row, 1965), pp. 204-16.

Gillingham, J., 'Chronicles and Coins as Evidence for Levels of Tribute and Taxation in Late Tenth- and Early Eleventh-Century England', *English Historical Review*, 105 (1990), 939-950.

— 'The Most Precious Jewel in the English Crown: Levels of Denegeld and Heregeld in the Early Eleventh Century', *English Historical Review*, 104 (1989), 373-384.

Gooch, M., 'Notes on the Swordless St Peter Coinage', *Numismatic Circular*, 115 (2007), 208.

Good, I.J., 'The Population Frequencies of Species and the Estimation of Population Parameters', *Biometrika*, 40 (1953), 237-64.

Graham-Campbell, J. (ed.), *The Cuerdale Hoard*, British Museum Research Publications, 185 (London: British Museum Press, forthcoming).

— ‘Some Reflections on “Silver Economy in the Viking Age”’, in *Silver Economy in the Viking Age*, ed. by J. Graham-Campbell and G. Williams (Walnut Creek, CA: Left Coast Press, 2007), pp. 215-223.

— ‘The Dual Economy of the Danelaw: The Howard Linecar Memorial Lecture 2001’, *British Numismatic Journal*, 71 (2001), 49-59.

— ‘The Northern Hoards: From Cuerdale to Bossall/Flaxton’, in *Edward the Elder, 899-924*, ed. by N. Higham and D.H. Hill (London: Routledge, 2001), pp. 212-229.

— ‘A “Vital” Yorkshire Viking Hoard Revisited’, in *In Search of Cult: Archaeological Investigations in Honour of Philip Rahtz*, ed. by M. Carver (Woodbridge: University of York Archaeological Papers, 1993), pp. 79-84.

— (ed.), *Viking Treasure from the North West: The Cuerdale Hoard in its Context* (Liverpool Museum: National Museums and Galleries on Merseyside Occasional Papers, 1992).

— ‘The Cuerdale Hoard: Comparisons and Context’, in *Viking Treasure from the North West: The Cuerdale Hoard in its Context* (Liverpool Museum: National Museums and Galleries on Merseyside Occasional Papers, 1992), pp. 107-115.

— ‘The Cuerdale Hoard: A Viking and Victorian Treasure’, in *Viking Treasure from the North West: The Cuerdale Hoard in its Context*, ed. by J. Graham-Campbell (Liverpool Museum: National Museums and Galleries on Merseyside Occasional Papers, 1992), pp. 1-14.

— ‘The Coinless Hoard’, in *Coins and Archaeology. Medieval Research Group: Proceedings of the First Meeting at Isegran, Norway, 1988*, British Archaeological Reports, International Series, 556, ed. by H. Clarke and E. Schia (Oxford: BAR, 1989), pp. 53-61.

— *The Viking World* (New Haven, CT: Ticknor & Fields, 1980).

— ‘The Viking-Age Silver Hoards of Ireland’, in *Proceedings of the Seventh Viking Congress, Dublin, 1973*, ed. by B. Almqvist and D. Greene (Dublin: Royal Irish Academy, 1976), pp. 39-74.

Graham-Campbell, J., and J. Sheehan, ‘The Catalogue’, in *The Huxley Viking Hoard: Scandinavian Settlement in the North West*, ed. by J. Graham-Campbell and R. Philpott (Liverpool: National Museums Liverpool, 2009), pp. 51-7.

— ‘Viking Age Gold and Silver from Irish Crannogs and Other Watery Places’, *Journal of Irish Archaeology*, 18 (2009), pp. 77-93.

Grantham, Major E., *Sotheby's Sale*, 3rd February, 1897.

Grantley, Fifth Baron, *Glendinning's Sale*, 22nd March, 1944.

Grierson, P., *The Coins of Medieval Europe* (London: Seaby, 1991).

— ‘The Gratia Dei Rex Coinage of Charles the Bald’, in *Charles the Bald: Court and Kingdom, Papers Based on a Colloquium Held in London in April 1979*, British Archaeological Reports, International series, 101, ed. by M.T. Gibson and J.L. Nelson (Oxford: BAR, 1981), pp. 39-57.

— ‘Carolingian Europe and the Arabs: The Myth of the Mancus’, in *Dark Age Numismatics: Selected Studies*, by P. Grierson (London: Variorum Reprints, 1979), pp. 1059-74.

— ‘The Volume of Anglo-Saxon Coinage’, in *Dark Age Numismatics: Selected Studies*, by P. Grierson (London: Variorum Reprints, 1979), pp. 153-60.

— ‘Money and Coinage under Charlemagne’, in *Dark Age Numismatics: Selected Studies*, by P. Grierson (London: Variorum Reprints, 1979), pp. 501-6.

— *Numismatics* (Oxford: Oxford University Press, 1975).

— ‘Commerce in the Dark Ages: A Critique of the Evidence’, *Transactions of the Royal Historical Society*, 5th ser., 9 (1959), 123-40.

— *Fitzwilliam Museum Cambridge: Ancient British and Anglo-Saxon Coins*, Sylloge of the Coins of the British Isles, 1 (London: Published for the British Academy, 1958).

— ‘Mint Output in the Tenth Century’, *The Economic History Review*, 9 (1957), 462-6.

Grierson, P., and M.A.S. Blackburn, *Medieval European Coinage, with a Catalogue of the Coins in the Fitzwilliam Museum, Cambridge, Volume 1: The Early Middle Ages (Fifth to Tenth Centuries)* (Cambridge: Cambridge University Press, 1986).

Griffiths, D., ‘The Archaeological Background’, in *The Huxley Viking Hoard: Scandinavian Settlement in the North West*, ed. by J. Graham-Campbell and R. Philpott (Liverpool: National Museums Liverpool, 2009), pp. 13-23.

— ‘The Coastal Trading Ports of the Irish Sea’, in *Viking Treasure from the North West: The Cuerdale Hoard in its Context* (Liverpool Museum: National Museums and Galleries on Merseyside Occasional Papers, 1992), pp. 63-72.

— ‘Anglo-Saxon England and the Irish Sea Region AD 800-1100: An Archaeological Study of the Lower Dee and Mersey as a Border Area’ (Unpublished Doctoral Thesis, University of Durham, 1991).

Grinsell, L.V., C.E. Blunt, and R.H.M. Dolley, *Bristol and Gloucester Museums: Ancient British and Coins of the Bristol and Gloucestershire Mints*, Sylloge of Coins of the British Isles, 19 (London: Published for the British Academy by the Oxford University Press and Spink, 1972).

Grueber, H.A., ‘The Douglas [Isle of Man] Find of Anglo-Saxon Coins and Ornaments’, *Numismatic Chronicle*, 4th ser., 13 (1913), 322-48.

— ‘A Find of Coins of Alfred the Great at Stamford’, *Numismatic Chronicle*, 4, 3rd ser. (1903), 347-355.

Gunstone, A.J.H., *Lincolnshire Collections: Coins from Lincolnshire Mints and Ancient British and Later Coins to 1272*, Sylloge of Coins of the British Isles, 27 (London: Published for the British Academy by the Oxford University Press and Spink, 1981).

— *West Country Museums: Ancient British, Anglo-Saxon and Anglo-Norman Coins*, Sylloge of Coins of the British Isles, 24 (Oxford: Oxford University Press, 1977).

— *Midland Museums: Ancient British, Anglo-Saxon and Norman Coins*, Sylloge of Coins of the British Isles, 17 (London: Published for the British Academy by the Oxford University Press and Spink, 1971).

Gunstone, A.J.H., with V. Smart *et al.*, *South-Eastern Museums: Ancient British, Anglo-Saxon and Later Coins to 1279*, Sylloge of Coins of the British Isles, 42 (London: Published for the British Academy by Oxford University Press and Spink, 1992).

Hadley, D.M., *The Northern Danelaw: Its Social Structure c.800-1100* (London: Leicester University Press, 2000).

Haigh, D.H., ‘The Danish Kings of Northumberland’, *Archaeologia Aeliana*, 2nd ser., 7 (1876), 21-77.

— ‘On the Pennies of Regnald’, *Numismatic Chronicle*, 2 (1839-40), 7-11.

— ‘On the Coins of the Cuerdale find, with the Names "Siefredus", "Cunnetti", and "Ebraice"', *Numismatic Chronicle*, 5 (1842), 105-17.

Hall, R.A., ‘The Topography of Anglo-Scandinavian York’, in *Aspects of Anglo-Scandinavian York*, by R.A. Hall, D.W. Rollason, M. Blackburn *et al.*, *The Archaeology of York*, 8/4 (London: Council for British Archaeology, 2004), pp. 488-503.

— ‘A Kingdom too far: York in the Early Tenth Century’, in *Edward the Elder, 899-924*, ed. by N. Higham and D.H. Hill (London: Routledge, 2001), pp. 188-200.

Hårdh, B., ‘Oriental-Scandinavian Contacts on the Volga, as Manifested by Silver Rings and Weight Systems,’ in *Silver Economy in the Viking Age*, ed. by J. Graham-Campbell and G. Williams (Walnut Creek: Left Coast Press, 2007), pp. 135-147.

— *Silver in the Viking Age: A Regional-Economic Study* (Stockholm: Almqvist & Wiksell International, 1996).

Hawkins, E., ‘An Account of the Coins and Treasure found in Cuerdale’, *Archaeological Journal*, 4 (1847), 111-30 and 189-99.

— ‘An Account of Coins and Treasure Found in Cuerdale’, *Numismatic Chronicle*, 5 (1842-3), 1-104.

Higham, N.J., 'Northumbria's Southern Frontier: A Review', *Early Medieval Europe*, 14 (2006), 391-418.

— 'The Context of Brunanburh', in *Names, Places and People: An Onomastic Miscellany in Memory of John McNeal Dodgson*, ed. by A.R. Rumble and A.D. Mills (Stamford: Paul Watkins, 1997), pp. 144-56.

— 'Northumbria, Mercia and the Irish Sea Norse, 893-926' in *Viking Treasure from the North West: The Cuerdale Hoard in its Context*, ed. by J. Graham-Campbell (Liverpool: National Museums and Galleries on Merseyside, 1992), pp. 21-30.

Hines, J., 'Re-Reading the Sculpture of Anglo-Saxon Cumbria', *Saga –Book of the Viking Society*, 22 (1986-9), 444-57.

Hinton, D.A., 'Coins and Commercial Centres in Anglo-Saxon England', in *Anglo-Saxon Monetary History*, ed. by M.A.S. Blackburn (Leicester: Leicester University Press, 1986), pp. 11-26.

Hitchcock, F. (ed.), *Treasure Annual Report 2004* (London: Department for Culture, Media and Sport, 2006).

Hodges, R., 'Trade and Market Origins in the Ninth Century: An Archaeological Perspective of Anglo-Carolingian Relations', in *Charles the Bald: Court and Kingdom*, ed. by M.T. Gibson and J.L. Nelson (Aldershot: Variorum, 1990), pp. 203-223.

— *Dark Age Economics: The Origins of Towns and Trade, AD 699-1000* (London: Duckworth, 1982).

Hodges, R., and D. Whitehouse, *Mohammed, Charlemagne and the Origins of Europe* (London: Duckworth, 1983).

Hollis, T. and T.B. Hollis, *Sotheby's Sale*, 14th May, 1817.

Hubert, J., J. Porche and W.F. Volback, *Europe in the Dark Ages* (London: Thames & Hudson, 1969).

Hughes, K., *The Church in Early Irish Society* (London: Methuen, 1966).

Hughes, T., 'On Some Anglo-Saxon Coins Discovered in the Foundations of St John's Church, Chester', *Chester Architectural Archaeological and Historical Society Journal* (1855/62 [1864]), 289-308.

Hugo, T., 'On the Field of Cuerdale', *Journal of the British Archaeological Association*, 8 (1853), 330-5.

Irvine, S. (ed.), *The Anglo-Saxon Chronicle: A Collaborative Edition, Vol. 7, MS E* (Cambridge, Brewer, 2004).

Jezierski, W. 'Æthelweardus Redivivus', *Early Medieval Europe*, 13 (2005), 159-78.

John, E., *Reassessing Anglo-Saxon England* (Manchester: Manchester University Press, 1996).

Johnson, D.F., 'The *Crux Usalis* as Apotropaic Weapon in Anglo-Saxon England', in *The Place of the Cross in Anglo-Saxon England*, ed. by C.E. Karkov, S.L. Keefer and K.L. Jolly (Woodbridge: Boydell, 2006), pp. 80-95.

Johnson South, T. (ed.), *Historia de Sancto Cuthberto: A History of Saint Cuthbert and a Record of His Patrimony*, (Cambridge: Brewer, 2002).

Jolly, K.L., C.E. Karkov and S.L. Keefer (eds), *Cross and Culture in Anglo-Saxon England: Studies in Honour of George Hardin Brown* (Morgantown: West Virginia University Press, 2008).

Jones, S.R.H., 'Transaction Costs, Institutional Change, and the Emergence of a Market Economy in Later Anglo-Saxon England', *Economic History Review*, ns., 46, (1993), 658-678.

— 'Devaluation and the Balance of Payments in Eleventh-Century England: An Exercise in Dark Age Economics', *The Economic History Review*, 44 (1991), 594-607.

Karkov, C.E., *The Ruler Portraits of Anglo-Saxon England* (Woodbridge: Boydell, 2004).

Karkov, C.E., S.L. Keefer and K.L. Jolly (eds), *The Place of the Cross in Anglo-Saxon England* (Woodbridge: Boydell, 2006).

Kelleher, R., 'The 'English Custom': Folding Coins in Medieval England', *Treasure Hunting Magazine* (April 2010), 79-82.

Kendall, C.B., 'From Sign to Vision: The Ruthwell Cross and *The Dream of the Rood*', in *The Place of the Cross in Anglo-Saxon England*, ed. by C.E. Karkov, S.L. Keefer and K.L. Jolly (Woodbridge: Boydell, 2006), pp. 129-44.

Kendrick, T.D., *Late Saxon and Viking Art* (London: Methuen, 1949).

— 'Bone Pins found with the Cuerdale Treasure', *Antiquaries Journal*, 21 (1941), 162-3.

Kenyon, J., 'Discovery of Ancient Coins and other Treasure near Preston', *Numismatic Chronicle*, 3 (1840/1), 62-5 and 112.

Kermode, P.M.C., 'Coin Hoard in The Woodbourne Treasure Trove, 1894', *Proceedings of the Isle of Man Natural History and Antiquarian Society*, ns., 1 (1913) 437.

Keynes, S., 'England, c.900-1016', in *The New Cambridge Medieval History, c.900-c.1024, III*, ed. by T. Reuter (Cambridge: Cambridge University Press, 1999), pp. 456-84.

— 'Rulers of the English, c.450-1066', in *The Blackwell Encyclopaedia of Anglo-Saxon England*, ed. by M. Lapidge, J. Blair, D. Keynes and D. Scragg (Oxford: Blackwell, 1999), pp. 500-16.

— 'Vikings', in *The Blackwell Encyclopaedia of Anglo-Saxon England*, ed. by M. Lapidge, J. Blair, D. Keynes and D. Scragg (Oxford: Blackwell, 1999), pp. 460-1.

Kilger, C., 'Coin Finds and the Idea of Monetary Space', *Nordisk Numismatisk Årsskrift 2000-2*, 8 (2006), 208-27.

Kinsey, R.S., 'Anglo-Saxon Law and Practice Relating to Mints and Moneyers', *British Numismatic Journal*, 29 (1958-9), 12-50.

Kluge, B., *State Museum, Berlin: Anglo-Saxon, Anglo-Norman and Hiberno-Norse Coins*, Sylloge of Coins of the British Isles, 36 (London: Published for the British Academy and the State Museum Berlin by Oxford University Press, 1987).

Kruse, S.E., 'Metallurgical Evidence of Silver Sources in the Irish Sea Province', in *Viking Treasure from the North West: The Cuerdale Hoard in its Context* (Liverpool: National Museums and Galleries on Merseyside Occasional Papers, 1992), pp. 73-88.

— 'The Viking-Age Silver Hoard from Scotby: The Non-Numismatic Element', *Transactions of the Cumberland and Westmoreland Antiquarian and Archaeological Society*, 86 (1986), 79-83.

La Riviere, L., *Spink Sale*, 9th October, 2002.

Lang, J., *Corpus of Anglo-Saxon Stone Sculpture*, 6: *Northern Yorkshire* (Oxford: Published for the British Academy by the Oxford University Press, 2001).

— 'The Hogback: A Viking Colonial Monument', in *Anglo-Saxon Studies in Archaeology and History*, 3, ed. by S. Chadwick Hawkes, J. Graham-Campbell and D. Brown (Oxford: British Archaeological Reports, 1994), pp. 85-176.

Lang, J., and G. Graham-Campbell, 'The Scientific Examination of a Fragment of a Silver Bossed Brooch from Cuerdale, Lancashire, England', *Norwegian Archaeological Review*, 9 (1976), 127-8.

Lawrence, L. A., *Glendinning's Sale*, 14th March, 1951.

Lawson, M.K., 'Danegeld and Heregeld Once More', *English Historical Review*, 105 (1990), 951-61.

— 'The Collection of Danegeld and Heregeld in the Reigns of Æthelred and Cnut', *English Historical Review*, 99 (1984), 721-38.

Le Goff, J., *Medieval Civilisation: 400-1500*, trans. by J. Barrow (Oxford: Blackwell, 1988).

Leimus, I., and A. Molvõgin, *Estonian Collections: Anglo-Saxon, Anglo-Norman and later British Coins*, Sylloge of Coins of the British Isles, 51 (London: Published for The British Academy by Oxford University Press and Spink, 2001).

Lewis, J., 'Silver Ingots from the Cuerdale Hoard in two Northern Collections', *Lancashire Archaeological Journal*, 2 (1982), 47-80.

Lewis, M. (ed.), *Treasure Annual Report 2007* (London: Department for Culture, Media and Sport, 2009).

Leyser, K.B., 'Ottonian Government', *English Historical Review*, 69:381 (1981), 721-753.

— *Rule and Conflict in Early Medieval Society: Ottonian Saxony* (Oxford: Blackwell, 1979).

- Lieber, A.E., 'International Trade and Coinage in the Northern Lands during the Early Middle Ages: An Introduction', in *Viking-Age Coinage in the Northern Lands: The Sixth Oxford Symposium on Coinage and Monetary History*, British Archaeological Reports, International series, 122, ed. by M.A.S. Blackburn and D.M. Metcalf (Oxford: BAR, 1981), pp. 1-34.
- Lindsay, J., *A View of the Coinage of Scotland* (Cork: Messers. Bolster, 1845).
- 'On Some Anglo-Saxon Stycas', *Numismatic Chronicle*, 6 (1843-4), 38-41
- 'Anglo-Saxon Coins Found at Lough Lyn, near Mullingar County, Westmeath', *Numismatic Chronicle*, 6 (1843-4), 216-17.
- 'Anglo-Saxon Coins Found in Co. Tipperary', *Numismatic Chronicle*, 6 (1843-4), 217.
- *A View of the Coinage of the Heptarchy* (Cork: Messers. Bolster, 1842).
- *A View of the Coinage of Ireland* (Cork: Luke H. Bolster, 1839).
- Lindgrén, S and J. Neumann, J. 'Viking Weather-Vane Practices in Medieval France', *Fornvännen*, 78 (1984), 197-203.
- Lockett, R.C., *Glendinning's Sale*, 6th June, 1955; 4th November, 1958; 26th April, 1960.
- Lowick, N.M., 'The Kufic Coins from Cuerdale', *British Numismatic Journal*, 47 (1980), 19-28.
- Loyn, H.R., 'Progress in Anglo-Saxon Monetary History', in *Anglo-Saxon Monetary History*, ed. by M.A.S. Blackburn (Leicester: Leicester University Press, 1986), pp. 1-10.
- *The Governance of Anglo-Saxon England, 500-1087* (London: Edward Arnold, 1984).
- 'Boroughs and Mints, 900-1066', in *Anglo-Saxon Coins: Studies Presented to F.M. Stenton on the Occasion of his 80th Birthday*, ed. by R.H.M. Dolley (London: Meuthen, 1961), pp. 122-35.
- Lyon, C.S.S., 'Minting in Winchester: An Introduction and Statistical Analysis', in *The Winchester Mint and Coins and Related Finds from the Excavations of 1961-71*, ed. by M. Biddle, Winchester Studies, 8 (Oxford: Clarendon Press, 2012), pp. 3-54.
- 'Anglo-Saxon Numismatics', *British Numismatic Journal*, 73 (2003), 58-75.
- 'Die Estimation: Some Experiments with Simulated Samples of a Coinage', *British Numismatic Journal*, 59 (1989), 1-12.
- 'A Reappraisal of the Sceatta and Styca Coinage of Northumbria', *British Numismatic Journal*, 28 (1955-7), 227-42.
- 'Some Uses of Scatter Diagrams for Demonstrating the Heterogeneity in Viking-Age Coinage and Coin Hoards', in *Viking-Age Coinage in the Northern Lands: The Sixth Oxford Symposium on Coinage and Monetary History*, British Archaeological Reports, International series, 122, ed. by M.A.S. Blackburn and D.M. Metcalf (Oxford: BAR, 1981), pp. 383-9.

- ‘The Metrology of Æthelred’s Long Cross Type at Lincoln’, in *Viking-Age Coinage in the Northern Lands: The Sixth Oxford Symposium on Coinage and Monetary History*, British Archaeological Reports, International series, 122, ed. by M.A.S. Blackburn and D.M. Metcalf (Oxford: BAR, 1981), pp. 525-31.
- ‘Variations in Late Anglo-Saxon England’, in *Mints, Dies and Currency: Essays Dedicated to the Memory of Albert Baldwin*, ed. by R.A.G. Carson (London: Methuen, 1971), pp. 101-20.
- ‘Analysis of the Material’, in *The Lincoln Mint, c.890-1279*, ed. by H.R. Mossop (Newcastle-upon-Tyne: Corbitt & Hunter, 1970), pp. 11-19.
- ‘Historical Problems of Anglo-Saxon Coinage (4): The Viking age’, *British Numismatic Journal*, 39 (1970), 193-204.
- ‘Historical Problems of Anglo-Saxon Coinage (2): The Ninth Century, Offa to Alfred’, *British Numismatic Journal*, 37 (1968), 216-38.
- Lyon, C.S.S., and B.H.I.H. Stewart, ‘The Classification of Northumbrian Viking Coins in the Cuerdale Hoard’, *Numismatic Chronicle*, 7th ser., 4 (1964), 281-2.
- ‘The Northumbrian Viking Coinage in the Cuerdale Hoard,’ in *Anglo-Saxon Coins: Studies Presented to F.M. Stenton on the Occasion of his 80th Birthday*, ed. by R.H.M. Dolley (London: Methuen, 1961), pp. 96-121.
- Mac Airt, S., and G. Mac Nichol (eds and trans), *The Annals of Ulster (to AD 1131): Text and Translation* (Dublin: Dublin Institute for Advances Studies, 1983).
- Mack, R.P., *Glendinning’s and Spink’s Sale*, 18th November, 1975; 22nd March, 1977.
- *Ancient British, Anglo-Saxon, and Norman Coins in the Collection of Commander R.P. Mack, R.N.*, Sylloge of Coins of the British Isles, 20 (London: Published for the British Academy by the Oxford University Press and Spink, 1973)
- ‘St John’s Church, Chester, Hoard of 1862’, *British Numismatic Journal*, 36 (1967), 36-39.
- MacTurk, R.W., ‘Scandinavian Sacral Kingship Revisited’, *Saga-Book: Viking Society of Northern Research*, 24:1 (1994), 19-32.
- ‘Sacral Kingship in Ancient Scandinavia: A Review of some Recent Writings’, *Saga-Book of the Viking Society*, 19 (1974-77), 139-69.
- ‘Review: Alfred P. Smyth, *Scandinavian York and Dublin*’, *Saga-Book of the Viking Society*, 19 (1974-77), 471-4.
- Malmer, B., ‘South Scandinavian Coinage in the Ninth Century’, in *Silver Economy in the Viking Age*, ed. by J. Graham-Campbell and G. Williams (Walnut Creek (CA): Left Coast Press, 2007), pp. 13-27.
- *The Anglo-Scandinavian Coinage c.995-1020*, *Commentationes de Nummis Saeculorum IX-XI* in

Sueca Repertis, Nova Series, 9 (Stockholm: Royal Swedish Academy of Letters, History and Antiquities, 1997).

— *The Sigtuna Coinage c.995-1005*, Commentationes de Nummis Saeculorum IX-XI in Sueca Repertis, Nova Series, 4 (Stockholm: Royal Swedish Academy of Letters, History and Antiquities, 1989).

— 'Some Thoughts on the Secondary Treatment of Viking-age Coins found on Gotland and in Poland', *Folksie Towarzystwo Archeologicznei Numisnatyczne Komisja Numizmatyczna. Nummus et Historia Pieniacz Europy Sreaniowicznej* (1985), 49-56.

Margary, I.D. , *Roman Roads in Britain* (London: Baker, 1957).

Maus, M. , *The Gift: The Form and Reason for Exchange in Archaic Societies*, trans. by W.D. Halls (London: Routledge, 1990 [1950]).

Mawer, A., 'The Redemption of the Five Boroughs', *English Historical Review*, 38 (1923), 551-7.

Mayhew, N.J., 'Money Supply, and the Velocity of Circulation in England, 1300-1700', *Economic History Review*, 48 (1995), 238-57.

— (ed.), *Edwardian Monetary Affairs, 1279-1344*, British Archaeological Reports, British series, 36 (Oxford: BAR, 1977).

Maurer, B., 'The Anthropology of Money', *Annual Review of Anthropology*, 35 (2006), 15-36.

Mayr-Harting, H., *The Coming of Christianity to Anglo-Saxon England* (London: Batsford, 1991).

McCormick, M., *Origins of the European Economy: Communications and Commerce, AD 300-900* (Cambridge: Cambridge University Press, 2001).

McK. Clough, T.H., *Museums in East Anglia: Morley St Peter Hoard and Anglo-Saxon, Norman, and Angevin Coins, and Later Coins of the Norwich Mint*, Sylloge of Coins of the British Isles, 33 (London: Spink, 1980).

McKernall, M., and R.B.K.Stevenson, 'Some Analyses of Anglo-Saxon and Associated Oriental Silver Coinage', in *Methods of Chemical and Metallurgical Investigation of Ancient Coinage: A Symposium held by the Royal Numismatic Society at Burlington House, London on 9-11 December 1970*, ed. by E.T. Hall and D.M. Metcalf (London: Royal Numismatic Society, 1972), pp. 195-209.

McKitterick, R., *The Carolingians and the Written Word* (Cambridge: Cambridge University Press, 1989).

— *The Frankish Kingdoms under the Carolingians, 751-987* (London: Longman, 1983).

McManners, J., *The Oxford Illustrated History of Christianity* (Oxford: Oxford University Press, 2001).

Megaw, B.R.S., 'The Douglas Treasure Trove: A Hoard of the Viking Age', *Journal of the Manx Museum*, 4:57 (1938), 77-80 and 82.

Metcalf, D.M., 'Regions around the North Sea with a Monetised Economy in the Pre-Viking and Viking Ages' in *Silver Economy in the Viking Age*, ed. by J. Graham-Campbell and G. Williams (Walnut Creek, CA: Left Coast Press, 2007), pp. 1-12.

— *An Atlas of Anglo-Saxon and Norman Coin Finds, c.973-1086* (London: Royal Numismatic Society Special Publications, 1998).

— *Thrymsas and Sceattas in the Ashmolean Museum Oxford* (London: Royal Numismatic Society and Ashmolean Museum, Oxford, 1993-1994).

— 'The Monetary Economy of the Irish Sea Province', in *Viking Treasure from the North West: The Cuerdale Hoard in its Context* (Liverpool Museum: National Museums and Galleries on Merseyside Occasional Papers, 1992), pp. 89-106.

— 'A Sketch of the Currency in the Time of Charles the Bald', in *Charles the Bald: Court and Kingdom*, ed. by M.T. Gibson and J.L. Nelson (Aldershot: Variorum, 1990), pp. 65-97.

— 'Large Danegelds in Relation to War and Kingship: Their Implications for Monetary History and Some Numismatic Evidence', in *Weapons and Warfare in Anglo-Saxon England*, ed. by S. Hawkes (Oxford: Oxford University Committee for Archaeology, 1989), pp. 179-89

— 'The Monetary History of England in the Tenth Century Viewed in the Perspective of the Eleventh Century', in *Anglo-Saxon Monetary History*, ed. by M.A.S. Blackburn (Leicester: Leicester University Press, 1986), pp. 133-57.

— 'The Ranking of the Boroughs: Numismatic Evidence from the Reign of Aethelred II', in *Ethelred the Unready: Papers from the Millenary Conference*, British Archaeological Reports, British Series, 59, ed. by D. Hill (Oxford: British Archaeological Reports, 1978), pp. 159-212.

— 'A Survey of Numismatic Research into the Pennies of the First Three Edwards, 1279-1344, and their Continental Imitations', in *Edwardian Monetary Affairs*, British Archaeological Reports, British Series, 36, ed. by N. J. Higham (Oxford: BAR, 1977), pp. 1-31.

— 'Analyses of the Metal Contents of Medieval Coins', in *Methods of Chemical and Metallurgical Investigation of Ancient Coinage: A Symposium Held by the Royal Numismatic Society at Burlington House, London on 9-11 December 1970*, ed. by E.T. Hall and D.M. Metcalf (London: Royal Numismatic Society, 1972), pp. 383-434.

— 'How Large Was the Anglo-Saxon Currency?', *Economic History Review*, 18 (1965), 475-82.

Mikolajczek, A., *Polish Museums: Anglo-Saxon and Late Medieval British Coins*, Sylloge of Coins of the British Isles, 37 (Oxford: Published for the British Academy and the Archaeological and Ethnographical Museum in Łódź by Oxford University Press and Spink, 1987).

Miller, D., 'Materiality: An Introduction', in *Materiality*, ed. by D. Miller (Durham, USA: Duke University Press, 2005), pp. 1-50.

- Milne, J.G., 'A Note on the Harkirke Find', *Numismatic Chronicle*, 15 (1935), 292.
- Moesgaard, J.C., 'Single Finds as Evidence for Coin Circulation in the Middle Ages: Status and Perspectives', *Nordisk Numismatisk Årsskrift 2000-2*, 8 (2006), 228-75.
- Montagu, H., *Sotheby's Sale*, 15th February, 1886; 7th May, 1888; 18th November, 1895; 2nd May, 1896.
- Moorhead, S., A. Booth and R. Bland, *The Frome Hoard* (London: British Museum Press, 2011)
- Morris, C.D., 'The Vikings in the British Isles: Some Aspects of their Settlement and Economy', in *The Vikings*, ed. by R.T. Farrell (London: Phillimore, 1982), pp. 70-94.
- Mørholm, O., *Early Hellenistic Coinage: From the Accession of Alexander to the Peace of Apamea, 336-186 B.C.* (Cambridge: Cambridge University Press, 1991).
- Mossop, H.R., *The Lincoln Mint, c.890-1279* (Newcastle-upon-Tyne: Corbitt & Hunter, 1970).
- Murchison, Capt. R.M., *Sotheby's Sale*, 28th May, 1866.
- Murdoch, J.G., *Sotheby's Sale*, 31st March, 1903.
- Murphy, D. (ed.), *The Annals of Clonmacnoise: Being Annals of Ireland from the Earliest Period to A.D. 1408*, trans by C. Mageoghagan (Dublin: Royal Society of Antiquaries of Ireland, 1896).
- R.A.B. Mynors (ed.), *Gesta Regum Anglorum = The History of the English Kings / William of Malmesbury*, completed by R.M. Thomson and M. Winterbottom (Oxford: Clarendon, 1998).
- Naismith, R., *Money and Power in Anglo-Saxon England: The Southern English Kingdoms, 757-865* (Cambridge: Cambridge University Press, 2012).
- *The Coinage of Southern England 796-c. 865*, (London: British Numismatic Society Special Publication, 2012).
- 'Coinage and History in Southumbrian England, c.750-865' (Unpublished Doctoral Thesis, University of Cambridge, 2009).
- National Archives, London, E/29/1/1-192: Medieval coin dies.
- Naylor, J. 'The Circulation of Early-Medieval European Coinage: A Case Study from Yorkshire, c.650-c.867', *Medieval Archaeology*, 51 (2007), 41-61.
- Nelson, J.L., 'Introduction', in *The Languages of Gift in the Early Middle Ages*, ed. by W. Davies, and P. Fouracre (Cambridge: Cambridge University Press, 2010) pp. 1-17.
- 'Rulers and Government', in *The New Cambridge Medieval History, c.900-c.1024, III*, ed. by T. Reuter (Cambridge: Cambridge University Press, 1999), pp. 95-129.
- 'The Frankish Kingdoms, 814-98: The West', in *The New Cambridge Medieval History, c.700-c.900, II*, ed. by R. McKitterick (Cambridge: Cambridge University Press, 1995), pp. 110-41.

— 'Kingship and Royal Government', in *The New Cambridge Medieval History, c.700-c.900*, II, ed. by R. McKitterick (Cambridge: Cambridge University Press, 1995), pp. 383-430.

— 'The Lord's Anointed and the People's Choice: Carolingian Royal Ritual,' in *Rituals of Royalty: Power and Ceremonial in Traditional Societies*, ed. by David Cannadine (Cambridge: Cambridge University Press, 1987), pp. 137-180.

— 'Inauguration Rituals' in *Early Medieval Kingship*, ed. by P.H. Sawyer and I.N. Wood (Leeds: University of Leeds, 1977), pp. 50-71.

— 'Royal Saints and Early Medieval Kingship', in *Sanctity and Secularity: The Church and the World: Papers Read at the Eleventh Summer Meeting and the Twelfth Winter Meeting of the Ecclesiastical History Society*, ed. by D. Baker, Studies in Church History, 10 (Oxford: Blackwell, 1973).

Nelson, P., 'The St Peter Coins of York', *Numismatic Chronicle* (1949), 116.

Neuman de Veguar, C., 'In Hoc Signio: The Cross on Secular Objects and the Process of Conversion', in *Cross and Culture in Anglo-Saxon England: Studies in Honour of George Hardin Brown*, ed. by K.L. Jolly, C.E. Karkov and S.L. Keefer (Morgantown: West Virginia University Press, 2008), pp. 79-117.

Nightingale, P. 'The Evolution of Weight-Standards and the Creation of New Monetary Links in Northern Europe from the Tenth Century to the Twelfth Century', *Economic History Review*, 38 (1985), 192-209.

Nordal, S. (ed.), *Egils Saga Skalla-Grímssonar* (Reykjavík: Hid Íslenzka, 1933).

North, J.J., *English Hammered Coinage: Volume I, Early Anglo-Saxon England to Henry III, c.600-1272*, 3rd edn (London: Spink, 1994).

North, R., 'End Time and the Date of Volsupá: Two Models of Conversion', in *Conversion and Colonization in Anglo-Saxon England*, ed. by C.E. Karkov and N. Howe (Tempe, Arizona: Arizona Center for Medieval and Renaissance Studies, 2006), pp. 213-36.

O'Brien O'Keefe, K. (ed), *The Anglo-Saxon Chronicle: A Collaborative Edition, Vol. 5, MS C* (Cambridge: D.S. Brewer, 2001).

O'Clery, M. (ed.), *Annála Rioghachta Éireann: Annals of the Kingdom of Ireland by the Four Masters, from the Earliest Period to the Year 1616, Edited with a translation and copious notes by J. O'Donovan*, 7 vols (Dublin: Hodges and Smith, 1851).

O'Hagan, H.A., *Sotheby's Sale*, 16th December, 1907; 27th April, 1908; 4th May, 1908; 13th July, 1908; *Christie's Sale*, 6th April, 1916.

Oman, C., 'The Danish Kingdom of York, 876-954', *Archaeological Journal*, 91 (1934), 1-21.

Owen, G.R., *Rites and Religions of the Anglo-Saxons* (Newton Abbot: David & Charles, 1981).

Pagan, H.E., 'The 1894 Ballaquayle Hoard: Five Further Parcels of Coins Æthelstan-Eadgar', *British Numismatic Journal*, 50 (1980), 12-19.

— 'A Halfpenny of St Eadmund Essaying the York Mint Signature', *Numismatic Chronicle*, 135 (1975), 191-4.

Page, W., *A History of the County of York North Riding*, Victoria County History, II (1923).

Parry, J., and M. Bloch, 'Introduction: Money and the Morality of Exchange', in *Money and the Morality of Exchange*, ed. by J. Parry and M. Bloch (Cambridge: Cambridge University Press, 1989), pp. 1-32.

Peacock, J., 'Find of Saxon coins at Chester', *Numismatic Chronicle*, ns., 6 (1866), 322.

Peterson, H.B.A., *Anglo-Saxon Currency: King Edgar's Reform to the Norman Conquest* (Lund: Gleerup, 1969).

Petit Andrews, J., 'Exhibited Seven Coins of Anglo-Saxon Kings ...found July 1762 under a skull in the Churchyard of Kintbury, Berks', *Archaeologia*, 8 (1787), 430-1.

Petrie, G., 'List of Treasure Trove, from Orkney and Other Places, Presented to the Museum by the Exchequer', *Proceedings of the Society of Antiquaries of Scotland*, 3 (1857/60), 246-7, 249-50.

Phythian-Adams, C., *Land of the Cumbrians: A Study in British Provincial Origins AD 400-1200* (Aldershot: Solar Press, 1996).

Pirenne, H., *Mohammed and Charlemagne*, trans. by B. Miall (London: Unwin, 1939).

— *Economic and Social History of Medieval Europe*, trans. by I.E. Clegg (London: Paul, 1936).

Pirie, E.J.E., 'Contrasts and Continuity within the Coinage of Northumbria c.670-876', in *Coinage and History in the North Sea World, c. AD 500-1200: Essays in Honour of Marion Archibald*, ed. by B.J. Cook and G. Williams (Leiden: Brill, 2006), pp. 211-39.

— *Coins of the Kingdom of Northumbria, c.700-867 in the Yorkshire Collections: The Yorkshire Museum, York, the University of Leeds, the City Museum, Leeds* (Llanfyllin: Galata, 1996).

— *Yorkshire Collections: Coins from Northumbrian Mints c.895-1279, Ancient British and Later Coins from Other Mints to 1279*, Sylloge of Coins of the British Isles, 21 (London: Published for the British Academy by the Oxford University Press and Spink, 1975).

— *Grosvenor Museum, Chester: Coins with the Chester Mint-Signature*, Sylloge of Coins of the British Isles, 5 (London: Published for the British Academy by the Oxford University Press and Spink, 1964).

Polanyi, K., 'The Place of Economics in Societies,' in *Trade and Market in the Early Empires: Economies in History and Theory*, ed. by K. Polanyi, C.M. Arensberg and H.W. Pearson (Glencoe, IL: Free Press and Falcon's Wing Press, 1957), pp. 239-42.

- Postan, M.M., 'The Rise of a Monetary Economy', *Economic History Review*, 14 (1944), 123-4.
- Potin, V.M., *Hermitage Museum, St Petersburg: Part I, Anglo-Saxon Coins to 1016*, Sylloge of Coins of the British Isles, 50 (London: Published for the British Academy by Oxford University Press and Spink, 1999).
- Pounds, N.J.G., *An Economic History of Medieval Europe* (London: Longman, 1994).
- Quine, J., 'The Douglas Treasure Trove', *Yn Lioar Manninagh*, 2 (1901), 242-5.
- Radner, J. N., *Fragmentary Annals of Ireland* (Dublin: Dublin Institute for Advanced Studies, 1978).
- Rashleigh, E.W., *Sotheby's Sale*, 21st June, 1909.
- Rashleigh, J., 'Remarks on the Coins of the Anglo-Saxon and Danish Kings of Northumberland', *Numismatic Chronicle*, 2nd ser., 9 (1869), 54-105.
- Reade, G. H., 'Saxon Coins "Discovered in June, 1864" at Allardstown, near Killincoole Castle, co. Louth', *Proceedings and Transactions of the Kilkenny Archaeological Society*, 5 (1864), 375.
- Redknap, M., 'Silver and Commerce in Viking-Age North Wales', in *The Huxley Viking Hoard: Scandinavian Settlement in the North West*, ed. by J. Graham-Campbell and R. Philpott (Liverpool: National Museums Liverpool, 2009), pp. 29-41.
- 'Viking-Age Settlement in Wales and the Evidence from Llanbedrgoch', in *Land, Sea and Home: Proceedings of a Conference on Viking-Period Settlement at Cardiff, July 2001*, ed. by J. Hines, A. Lane and M. Redknap (Leeds: Maney, 2004), pp. 159-75.
- Reynolds, H.M., *Sotheby's Sale*, 4th May, 1914; 5th June, 1919.
- Rich, W.B., *Sotheby's Sale*, 7th July, 1828.
- Richardson, A.B., *Sotheby's Sale*, 22nd May, 1895.
- 'Notice of a Hoard of Broken Silver Ornaments and Anglo-Saxon and Oriental [Cufic] Coins found in Skye', *Proceedings of the Society of Antiquaries Scotland*, 26 (1891-2), 225-40.
- Richardson, C., 'A Find of Viking-Period Silver Brooches and Fragments from Flusco, Newbiggin, Cumbria', *Transactions of the Cumberland & Westmoreland Antiquarian and Archaeological Society*, 96 (1996), 35-44.
- Rigold, S.E., 'Change in the Light of Medieval Site Finds', in *Edwardian Monetary Affairs*, British Archaeological Reports, British Series, 36, ed. by N.J. Mayhew (Oxford: BAR, 1977), pp. 59-79.
- 'The Principal Series of English Sceattas', *British Numismatic Journal*, 7 (1977), 21-30.
- Robertson, A.S., *Hunterian Museum, Glasgow: Anglo-Saxon Coins*, Sylloge of Coins of the British Isles, 2 (London: Published for the British Academy, 1961).
- Robinson, T.W.U., *Sotheby's Sale*, 1st May, 1891.

- Rogerson, A., 'Six Middle Anglo-Saxon Sites in West Norfolk', in *Markets in Early Medieval Europe: Trading and 'Productive' Sites, 650-850*, ed. by T. Pestell and K. Ulmschneider (Macclesfield: Windgather, 2003), pp. 110-2.
- Rollason, D.W., 'Anglo-Saxon York: The Evidence of Historical Sources', in *Aspects of Anglo-Sacndinavian York*, by R.A. Hall, D.W. Rollason, M. Blackburn *et al*, The Archaeology of York, 8/4 (London: Council for British Archaeology, 2004), pp. 305-24.
- *Northumbria, 500-1100: Creation and Destruction of a Kingdom* (Cambridge: Cambridge University Press, 2003).
- (ed.), *Libellus de exordio atque procursu istius, hoc est Dunelmensis Ecclesie: Tract on the Origins and Progress of this the Church of Durham* (Oxford: Clarendon Press, 2000).
- 'Historical Evidence for Anglian York', in *Anglian York: A Survey of the Evidence*, The Archaeology of York. Anglian York, 7/2, D. Tweddle, J. Moulden and E. Logon (London: Council for British Archaeology, York Archaeology Trust, 1999), pp. 117-40.
- Rollason, D.W., with D. Gore and G. Fellows-Jensen, *Sources for York History to AD 1000*, The Archaeology of York, I (York: York Archaeological Trust, 1998).
- Ruding, R., *Annals of the Coinage of Great Britain and its Dependencies; From the Earliest Period of Authentic History to the Reign of Victoria*, I, 3rd edn (London: Printed for J. Hearne, 1840).
- Ryan, V.J.E., *Glendinning's Sale*, 22nd January, 1952.
- Sainthill, R., 'Notices of Coins, Published in the Gentleman's Magazine 1835 and 1836', *Olla Podrida*, I (London: John Bowyer Nichols and Son, 1844), pp. 105-6.
- Sawyer, P., 'The Last Scandinavian Kings of York', *Northern History*, 31 (1995), 39-44.
- 'Anglo-Scandinavian Trade in the Viking Age and After', in *Anglo-Saxon Monetary History*, ed. by M.A.S. Blackburn (Leicester: Leicester University Press, 1986), pp. 185-99.
- *Kings and Vikings: Scandinavia and Europe, AD 700-1100* (London: Methuen, 1982)
- 'The Causes of the Viking Age', in *The Vikings*, ed. by R.T. Farrell (London: Phillimore, 1982), pp. 1-7.
- 'Kings and Merchants', in *Early Medieval Kingship*, ed. by P.H. Sawyer and I.N. Wood (Leeds: University of Leeds, 1977), pp. 139-158.
- *Anglo-Saxon Charters: An Annotated List and Bibliography*, Royal Historical Society Guides and Handbooks, 8 (London: Royal Historical Society, 1968).
- *The Age of the Vikings* (London: E. Arnold, 1962).
- Sawyer, B., and P.Sawyer, *Medieval Scandinavia: From Conversion to Reformation circa 800-1500* (Minneapolis: University of Minnesota Press, 1993).

Scott, W.H., 'Report on A Large Hoard of Anglo-Saxon Pennies, in Silver, Found in the Island of Islay', *Proceedings of the Society of Antiquaries of Scotland*, 1 (1851/4), 74-81.

Selgin, G., *Good Money: Birmingham Button Makers, the Royal Mint, and the Beginnings of Modern Coinage, 1775-1821* (Oakland, CA: University of Michigan Press, 2008).

Sheehan, J., 'The Huxley Hoard and Hiberno-Scandinavian Arm-Rings' in *The Huxley Viking Hoard: Scandinavian Settlement in the North West*, ed. by J. Graham-Campbell and R. Philpott (Liverpool: National Museums Liverpool, 2009), pp. 58-69.

— 'The Form and Structure of Viking-Age Silver Hoards: The Evidence from Ireland', in *Silver Economy in the Viking Age*, ed. by J. Graham-Campbell and G. Williams (Walnut Creek: Left Coast Press, 2007), pp. 149-162.

— 'Social and Economic Integration in Viking-Age Ireland: The Evidence of the Hoards', in *Land, Sea and Home: Proceedings of a Conference on Viking-Period Settlement at Cardiff, July 2001*, ed. by J. Hines, A. Lane and M. Redknap (Leeds: Maney, 2004), pp. 177-87.

— 'Ireland's Early Viking-Age Silver Hoards: Components, Structure, and Classification', in *Vikings in the West*, ed. by S. Stummann Hansen and K. Randsborg, *Acta Archaeologica*, 71 (København: Munksgaard, 2000), pp. 49-63.

Shepherd, Revd. E.J., *Sotheby's Sale*, 22nd July, 1885.

Sheppard, Major, *Sotheby's Sale*, 25th February, 1864.

Simek, R., *Dictionary of Northern Mythology*, trans. by A. Hall (Cambridge: Brewer, 1993).

Simmel, G., *The Philosophy of Money*, trans. by T. Bottomore and D. Frisby, revised edn (London: Routledge, 1978).

Skre, D. (ed.), *Means of Exchange: Dealing with Silver in the Viking Age*, Kaupang Excavation Project Publication Series, II (Århus: Aarhus University Press, 2008).

Smart, V., 'Not the Oldest Known List: Scandinavian Moneyers' Names on the Tenth-Century English Coinage', in *Coinage and History in the North Sea World, c. AD 500-1250: Essays in Honour of Marion Archibald*, ed. by B.J. Cook and G. Williams (Leiden: Brill, 2006), pp. 297-324.

— 'Scandinavians, Celts and Germans in Anglo-Saxon England: The Evidence of Moneyers' Names', in *Anglo-Saxon Monetary History*, ed. by M.A.S. Blackburn (Leicester: Leicester University Press, 1986), pp. 171-84.

— 'The Moneyers of St Edmund', *Hikuin*, 11 (1985), 83-90.

Smith, A., *An Inquiry into the Nature and Causes of the Wealth of Nations*, ed. by E. Cannon (Chicago: University of Chicago, 1996 (1776)).

Smith, A., 'On Anglo-Saxon Coins Found in Ireland', *Numismatic Chronicle*, ns., 3 (1863), 255-7.

Smith, S., *Sotheby's Sale*, 11th July, 1895.

Smyth, A.P., *Scandinavian York and Dublin: The History and Archaeology of Two Related Viking Kingdoms*, II (Dublin: Humanities Press, 1987).

— 'The Black Foreigners of York and the White Foreigners of Dublin', *Saga-Book of the Viking Society*, 19: 4 (1977), 101-17.

— *Scandinavian Kings in the British Isles 850-880* (Oxford: Oxford University Press, 1977).

— *Scandinavian York and Dublin: The History and Archaeology of Two Related Viking Kingdoms*, I (Dublin: Humanities Press, 1975-9).

Souers, P.W., 'The Wayland Scene on the Franks Casket', *Speculum*, 18 (1943), 104-11.

Spencer, P.D., 'The "Ball-Cock" Hoard', *The Searcher*, 262 (2007), 44-5.

— 'The "Ball-Cock" Hoard Part III', *The Searcher*, 261 (2007), 27-30.

— 'The "Ball-Cock" Hoard Part II', *The Searcher*, 260 (2007), 27-9.

— 'Some Lead, Some Silver, and a "Ball-Cock"', *The Searcher*, 259 (2007), 26-8.

Spink, *Coins of England and the United Kingdom*, 45th edn (London: Spink, 2009).

— *Coins of England and the United Kingdom*, 42nd edn (London: Spink, 2006).

— *Numismatic Circular*, 54 (February 1946).

Stack, L., *Sotheby's Sale*, 22nd April, 1999.

Stafford, P., *Unification and Conquest: A Political and Social History of England in the Tenth and Eleventh Centuries* (London: E. Arnold, 1989).

Stenton, F., *Anglo-Saxon England*, 3rd edn (Oxford: Oxford University Press, 1971).

— 'The Road System of Medieval England', *The Economic History Review*, 7 (1936), 1-21.

Stevenson, R.B.K., *National Museum of Antiquities of Scotland, Edinburgh: Anglo-Saxon Coins*, Sylloge of Coins of the British Isles, 6 (London: Published for the British Academy by Oxford University Press and Spink, 1966).

— 'The Iona Hoard of Anglo-Saxon Coins', *Numismatic Chronicle*, 6th ser., 11 (1951), 68-90.

Stevenson, J. (ed.), *A History of the Kings of England*, (Church Historians of England, 1858; repr. Felinfach: Llanerch, 1987).

— (ed.), *The Church Historians of England, II, Part I: The Anglo-Saxon Chronicle, The Chronicle of Florence of Worcester* (London: Seeleys, 1853).

Stevenson, W.H. (ed.), *Asser's Life of King Alfred together with the Annals of St Neots erroneously ascribed to Asser* (Oxford: Clarendon, 1959).

Stewart, B.H.I.H., 'The English and Norman Mints' in *A New History of the Royal Mint*, ed. by C.E. Challis (Cambridge: Cambridge University Press, 1992), pp. 1-82.

— 'On the Date of the Bossall Hoard', *Numismatic Chronicle*, 151 (1991), 175-82.

— 'English Coinage from Athelstan to Edgar', *Numismatic Chronicle*, 48 (1988), 192-214.

— 'CVNETTI Reconsidered', in *Coinage in Ninth Century Northumbria*, British Archaeological Reports, British Series, 180, ed. by D.M. Metcalf (Oxford: BAR, 1987), pp. 345-54.

— 'The Anonymous Anglo-Viking Issue with Sword and Hammer Types and the Coinage of Sihtric I', *British Numismatic Journal*, 52 (1982), 108-16.

— 'The St Martin Coinage of Lincoln', *British Numismatic Journal*, 36 (1967), 46-54.

— 'Second Thoughts on Medieval Die-Output', *Numismatic Chronicle*, 7th ser., 4 (1964), 293-303.

— 'Medieval Die-Output: Two Calculations for English Mints in the Fourteenth Century', *Numismatic Chronicle*, 7th ser., 3 (1963), 97-106.

Stewartby, Lord, *English Coins, 1180-1551* (London: Spink, 2009).

Stewart, B.H.I.H., and C.S.S. Lyon, 'Chronology of the St Peter Coinage', *Yorkshire Numismatist*, 2 (1992), 45-73.

Strudwick, J.S. 'Saxon and Arabic Coins Found at Dean, Cumberland', *British Numismatic Journal*, 28 (1955-7), 177-80.

Sugden, K., and M. Warhurst, 'A Cuerdale Parcel Rediscovered', *British Numismatic Journal*, 48 (1978), 107-9.

Swanton, M. (ed. and trans.), *The Anglo-Saxon Chronicles* (London: Phoenix, 2000).

Taffs, W.W., *Glendinning's Sale*, 21st November, 1956.

Talvio, T., *National Museum, Helsinki: Anglo-Saxon and Anglo-Norman Coins*, Sylloge of Coins of the British Isles, 25 (London: Published for the British Academy by Oxford University Press and Spink, 1978).

Taylor, S., *The Anglo-Saxon Chronicle: A Collaborative Edition, Vol. 4, MS B* (Cambridge: Brewer, 1983).

Thompson, J.D.A., *Ashmolean Museum, Oxford: Part I, Anglo-Saxon Pennies*, Sylloge of Coins of the British Isles, 9 (London: Published for the British Academy by Oxford University Press and Spink, 1967).

— *Inventory of British Coin Hoards, AD 600-1500* (Oxford: Oxford University Press, 1956).

Thorburn, H.W., *Sotheby's Sale*, 27th November, 1918.

Thoresby, R., *Ducatus Leodiensis; or, the Topography of the Ancient and Populous Town and Parish of Leedes ... To which is added...a Catalogue of his Museum...particularly the Roman, British, Saxon, Danish, Norman and Scotch Coins, with Modern medals &c.* (Leeds: B. Dewhirst, 1816).

Townend, M., 'Whatever Happened to York Viking Poetry? Memory, Tradition and the Transmission of Skaldic Verse', *Saga-Book: Viking Society for Northern Research*, 27 (2003), 48-90.

Turville Petre, E.O.G., *Myth and Religion of the North: The Religion of Ancient Scandinavia* (London: Weidenfeld & Nicolson, 1964).

— *Origins of Icelandic Literature* (Oxford: Clarendon, 1953).

Tyssen, S., *Leigh & Sotheby's Sale*, 24th October, 1802.

Ullmann, W., *The Carolingian Renaissance and the Idea of Kingship* (London: Methuen, 1969).

Valante, M., 'Dublin's Economic Relations with Hinterland and Periphery in the Late Viking Age', in *Medieval Dublin I: Proceedings of the Friends of Medieval Dublin Symposium 1999*, ed. by S. Duffy (Dublin: Four Courts, 2000), pp. 69-83.

Vaux, W.S.W., 'An Account of a Find of Coins in the Parish of Goldborough, Yorkshire, *Numismatic Chronicle*, ns., 1 (1861), 65-71.

Verhulst, A., *The Carolingian Economy* (Cambridge: Cambridge University Press, 2002).

— 'The Origins of Towns in the Low Countries and the Pirenne Thesis', *Past and Present*, 122 (1989), 3-35.

Wainwright, F.T., 'The Battles at Corbridge', *Saga-Book of the Viking Society*, 13 (1946-53), 156-73.

Wallace-Hadrill, J.M., *The Long-Haired Kings and other Studies in Frankish History* (London: Methuen, 1982).

— *Early Germanic Kingship in England and on the Continent* (Oxford: Clarendon Press, 1971).

Walker, J., 'A Hoard of Anglo-Saxon Coins from Tetney', *Numismatic Chronicle*, 6th ser., 5 (1945), 81-95.

Walters, F.A., *Sotheby's Sale*, 24th October, 1932.

Watters, C.A., *Glendining's Sale*, 21st May, 1917.

Warhurst, M., *Merseyside County Museums: Ancient British and Later Coins to 1279*, Sylloge of Coins of the British Isles, 29 (London: Published for the British Academy by the Oxford University Press, 1982).

Webster, G., 'A Saxon Treasure Hoard Found at Chester', *Antiquaries Journal*, 33 (1953), 22-32.

Webster, L. (ed.), *Aspects of Production and Style in Dark Age Metalwork: Selected Papers Given to the British Museum Seminar on Jewellery AD 500-600* (London: British Museum, 1982).

— 'The Iconographic Programme of the Franks Casket', in *Northumbria's Golden Age*, ed. by J. Hawkes and S. Mills (Stroud: Sutton, 1999), pp. 227 – 246.

Webster, L., and J. Backhouse, *The Making of England: Anglo-Saxon Art and Culture AD 600-900* (London: British Museum Press, 1991)

Werner, M., 'The Liudhard Medalet', *Anglo-Saxon England*, 20 (1991) 27-41.

— 'The Cross-Carpet Page in the Book of Durrow: the Cult of the True Cross, Adomnan and Iona', *The Art Bulletin*, 72 (1990), 178.

Whitelock, D., 'The Dealings of the Kings of England with Northumbria in the Tenth and Eleventh Centuries', in *The Anglo-Saxons: Studies in Some Aspects of their History and Culture Presented to Bruce Dickins*, ed. by P. Clemoes (London: Bowes and Bowes, 1959), pp. 70-88.

— *English Historical Documents, c.500-1042*, I (London: Eyre and Spottiswoode, 1955).

Whitting, P.D., 'The Byzantine Empire and the Coinage of the Anglo-Saxons', in *Anglo-Saxon Coins: Studies Presented to F.M. Stenton on the Occasion of his 80th Birthday*, ed. by R.H.M. Dolley (London: Methuen, 1961), pp. 23-38.

Willett, H.R., *Sotheby's Sale*, 15th March, 1827.

Williams, G., 'The Cuerdale Coins', in *The Cuerdale Hoard*, ed. by J. Graham-Campbell, British Museum Research Publications, 185 (London: British Museum Press, forthcoming), pp. 39-71.

— 'List of Coins in the Goldsborough Hoard', in *The Cuerdale Hoard*, ed. by J. Graham-Campbell, British Museum Research Publications, 185 (London: British Museum Press, forthcoming), Appendix 5.

— 'Silver Economies, Monetisation and Society: An Overview', in *Silver Economies, Monetisation and Society in Scandinavia, 800-1100*, ed. by J. Graham-Campbell, S.M. Sindbæk, and G. Williams (Århus: Århus University Press, forthcoming).

— 'The Conquest of the Northern Danelaw in the Light of the Vale of York Hoard and Related Coinage', in *Proceedings of the Sixteenth Viking Congress*, ed. by G. Ólafsson and S. Sigmundsson (forthcoming).

— 'The Northern Hoards Revisited: Hoards and Silver Economy in the Northern Danelaw in the Early Tenth Century', in *Early Medieval Art and Archaeology in the Northern World*, ed. by A. Reynolds and L. Webster (Leiden: Brill, forthcoming).

— 'Hack-Silver and Precious Metal Economies: A View from the Viking Age', in *Late Roman Silver and the End of the Empire*, ed. by F. Hunter and K. Painter (Edinburgh: Society of Antiquaries, forthcoming).

— ‘Coinage and Monetary Circulation in the Northern Danelaw in the 920s in the Light of the Vale of York Hoard’, in *Studies in Early Medieval Coinage, II*, ed. by T. Abramson (Woodbridge: Boydell, 2011), pp. 156-65.

— ‘Hoards from the Northern Danelaw from Cuerdale to the Vale of York’, in *Vikings in the North-West*, ed. by J. Graham-Campbell and R. Philpott (Liverpool: National Museums Liverpool, 2009), pp. 73-83.

— ‘The Coins from the Vale of York Viking Hoard: Preliminary Report’, *British Numismatic Journal*, 78 (2008), 227-34.

— ‘Kingship, Christianity and Coinage: Monetary and Political Perspectives in Silver Economy in the Viking Age’, in *Silver Economy in the Viking Age*, ed. by J. Graham-Campbell and G. Williams (Walnut Creek, CA: Left Coast Press, 2007), pp. 177-214.

— ‘RORIVA CASTR: A New Danelaw Mint of the 920s’, *Suomen Numismaattisen Yhdistyksen julkaisuja*, 6 (2009), 41-7.

— ‘The Circulation and Function of Coinage in Conversion-Period England, c.580-675’, in *Coinage and History in the North Sea World, c. AD 500-1250: Essays in Honour of Marion Archibald*, ed. by B.J. Cook and G. Williams (Leiden: Brill, 2006), pp. 145-92.

— ‘Anglo-Saxon and Viking Coin Weights’, *British Numismatic Journal*, 69 (1999), 19-36.

Williams, G., and B. Ager, *The Vale of York Hoard: British Museum Objects in Focus* (London: British Museum Press, 2010).

Wilson, D.M., *Anglo-Saxon Art: From the Seventh Century to the Norman Conquest* (London: Thames and Hudson, 1984).

— ‘An Unpublished Fragment from the Goldsborough Hoard’, *Antiquaries Journal*, 37 (1958), 72-3.

Wise, Revd. F., *Langford's Sale*, 17 June, 1778.

Wood, I. N., ‘The Cross in the Landscape’, in *The Place of the Cross in Anglo-Saxon England*, ed. by C.E. Karkov, S.L. Keefer and K.L. Jolly (Woodbridge: Boydell, 2006), pp. 3-13.

— ‘Kings, Kingdoms and Consent’, in *Early Medieval Kingship*, ed. by P.H. Sawyer and I.N. Wood (Leeds: University of Leeds, 1977), pp. 6-29.

Wood, M., ‘The Making of King Athelstan's Empire: An English Charlemagne’, in *Ideal and Reality in Frankish and Anglo-Saxon Society*, ed. by P. Wormald, D.A. Bullough and R. Collins (Oxford: Oxford University Press, 1983), pp. 250-72.

— ‘Brunanburh Revisited’, *Saga-Book of the Viking Society for Northern Research*, 20 (1980), 200-17.

Woolf, A., *From Pictland to Alba 789-1070*, The New Edinburgh History of Scotland, 2 (Edinburgh: Edinburgh University Press, 2007).

— ‘Amlaíb Cuarán and the Gael, 941-81’, *Medieval Dublin*, 3 (2001), 34-43.

— ‘Erik Bloodaxe Revisited’, *Northern History*, 34 (1998), 189-93.

Wormald, C.P., ‘Viking Studies: Whence and Whither?’, in *The Vikings*, ed. by R.T. Farrell (London: Phillimore, 1982), pp. 128-53.

Worrell, S., ‘Finds Reported under the Portable Antiquities Scheme’, *Britannia*, 37 (2006), 429-66.